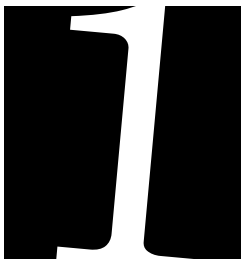
Chapter



Chapter 1

General Information

This chapter provides information and a general overview of the *ii*LINX Solid Inkjet 100 Printer. Theory of operation, printer specifications and components are presented in the following sections:

General Information

The *ii*LINX Solid Inkjet 100 printer, shown in Figure 1-1, is a user-installable, low maintenance, environmentally friendly, **High Quality Referral Image** PostScript printer.

Figure 1-1. The *ii*LINX Solid Inkjet 100 Printer (shown with optional Auxiliary Feeder Unit Assembly)

To ensure complete understanding of the Solid Inkjet 100 printer, we recommend participation in Solid Inkjet 100 printer service training.

Solid Inkjet 100 Printer Overview

The Solid Inkjet 100 Printer is an Adobe PostScript Level 3 (Version 3010) grayscale, solid inkjet printer. It supports 409 x 409 dots-per-inch (dpi) resolution at draft mode, and 600 x 600 dpi at High Resolution Medical mode. The speed of producing images is 4.8 pages-per-minute (ppm) in draft mode, and 2.5 ppm in High Resolution Medical mode.

Base Solid Inkjet 100 printer

The base Solid Inkjet 100 printer features 136 built-in fonts, and is equipped with 64 Mbytes of RAM. It can be upgraded to 128 Mbytes of RAM by adding an optional 64 Mbyte RAM DIMM.

All printers support two available paper trays: A and A4 trays and an optional 500-sheet high-capacity paper tray assembly give the printer a two-tray capability. The high-capacity paper tray assembly is usually referred to as an auxiliary feeder unit.

A 133-MHz PowerPC processor oversees print engine operations and PostScript image processing. The printer features an integral bidirectional parallel port (IEEE 1284C with ECP mode) and a 10baseT Ethernet port (with support for EtherTalk, TCP/IP, DHCP and Windows Peer-to-Peer). A USB high-speed serial port is also provided.

An optional Ethernet interface board offers a 10BaseT/100BaseT/10Base2 Ethernet connection providing standard protocol support for EtherTalk, TCP/IP and DHCP. When installed, this card disables the standard 10baseT port.

A second rear panel slot accommodates an internal IDE hard drive for DICOM support.

Solid inks

Solid inks, sometimes called phase-change inks, are solid at room temperature and are liquid at the higher temperature used during printing. The inks solidify almost instantly after being jetted onto the printer's drum. Each of the Solid Inkjet 100 printer inks is especially formulated for this printer; the inks are not interchangeable with other models of solid ink printers.

NOTE: Turning the printer off and allowing it to cool causes it to perform a printhead cleaning and purge cycle upon power-up. The printer's purge cycle consumes a significant amount of ink. During normal use and servicing, turn the printer off and allow it to cool only when necessary.

Memory Considerations

The printer dual frame buffer allows for printing one image while processing a second image (which gives greater printing throughput). With additional RAM memory, the printer's capabilities increase as detailed in Table 1-1:

Table 1-1. Installed RAM and Printer Capabilities

Feature	Base (64 Mbytes)	Additional RAM Upgrade (128 Mbytes)
Fast (draft) printing	yes	yes
High-Resolution Medical Printing	yes	yes
Pipelining	yes	yes
DICOM Support	no	yes

To verify what type of RAM is installed, print the 2-page Configuration Page from the Front Panel menu and refer to "Installed RAM."

For example:

Installed RAM:	64 Mbytes
Memory Slot 1:	SDRAM/Non-parity/32 Mbytes/ KMMe 665 403 CTL-GO
Memory Slot 2:	SDRAM/Non-parity/32 Mbytes/ 16LSDT 464AG-662C1

Print Engine Assemblies

Internal features of the print engine are illustrated in Figure 1-2.

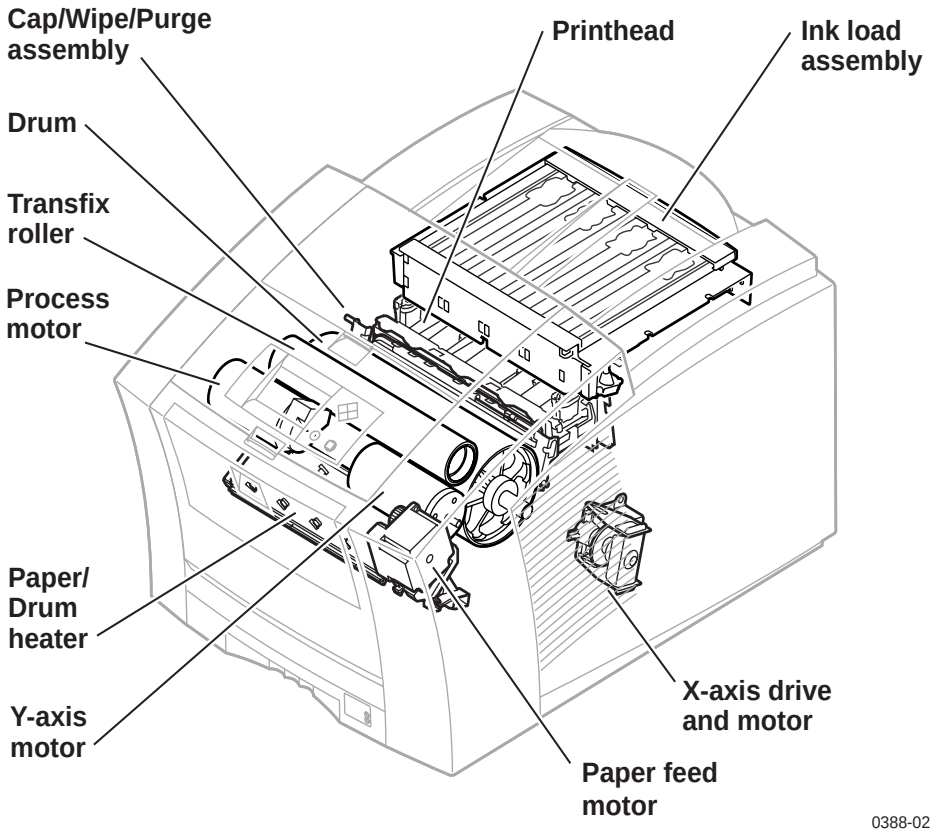


Figure 1-2. Internal Features of the Print Engine

Seven circuit boards support the printer's electronics. (Refer to Figures 1-3 and 1-4). Two boards, called I/O boards, left and right, support the front panel, solenoids and sensors. The main board contains the printer's CPU processor, RAM and ROM. The power supply accepts the AC input voltage and distributes it or converts it to various other levels of required DC voltages and distributes them. The power control board distributes power supply voltages to the other printer boards and drives many printer motors. The front panel provides a user interface to the printer. The printhead drive board, a part of the printhead, manages the signals and voltages of the printhead's printing elements and sensors. The optional Ethernet interface card and internal hard drive could be considered the eighth and ninth circuit boards.

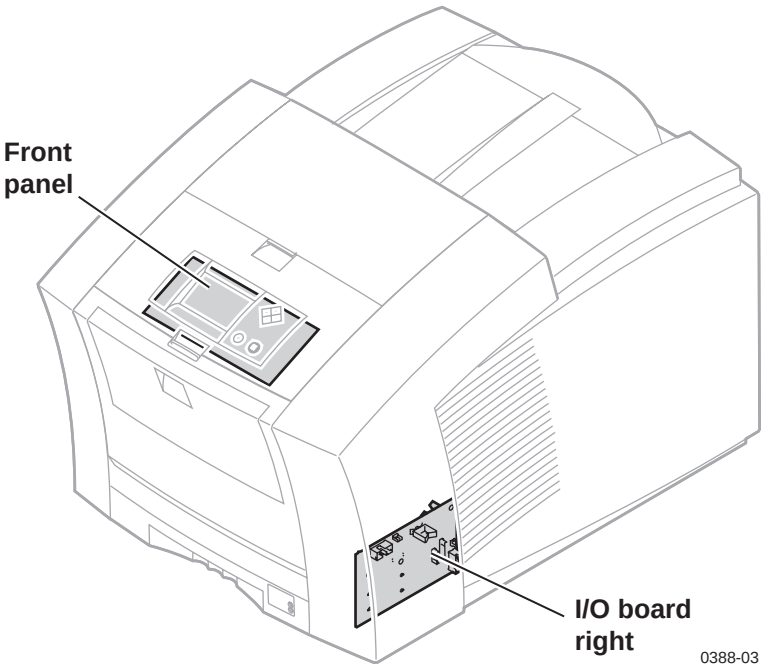


Figure 1-3. Circuit Boards of the Print Engine (Right Front View)

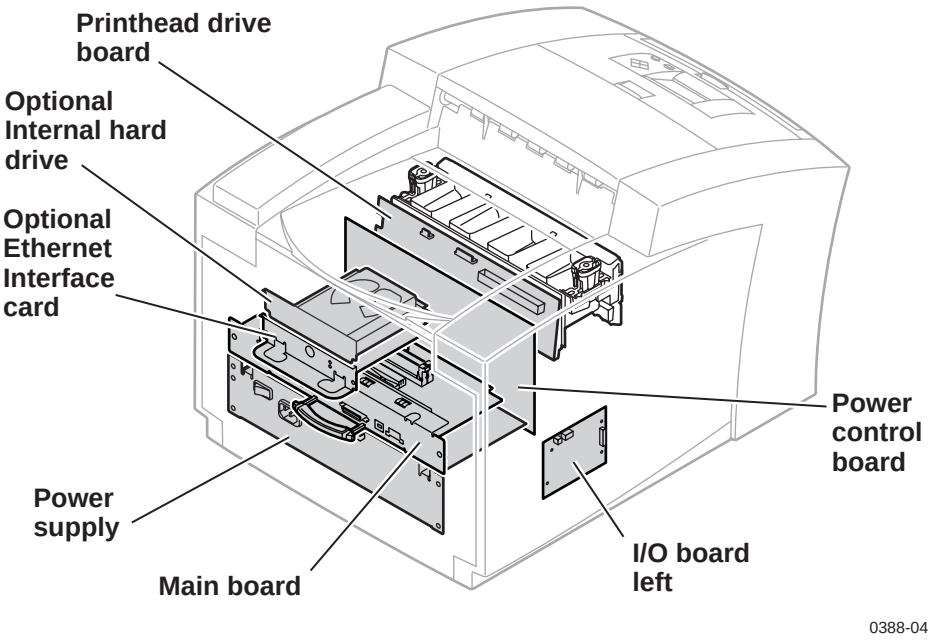


Figure 1-4. Circuit Boards of the Print Engine (Left Rear View)

An internal data bus, called the I^2C bus, connects all I/O boards to the main board. (Refer to Figure 1-5.) Through this single bus, the main board can "poll" the I/O boards for the state of the printer's sensors as well as actuate the printer's solenoids. This data bus greatly simplifies the wiring that would otherwise be required for monitoring numerous sensors and solenoids. The I^2C bus also extends down to the Auxiliary Feeder Unit.

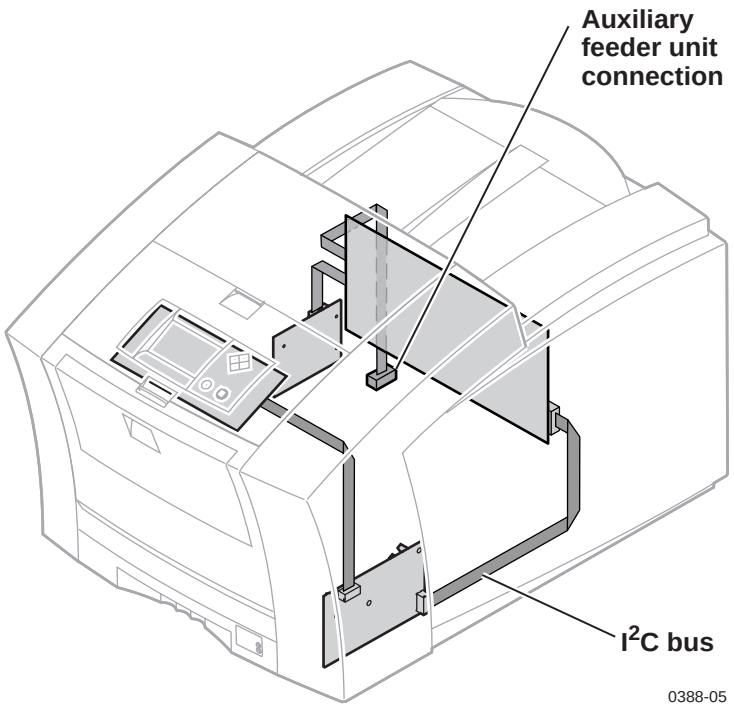


Figure 1-5. The Printer's I^2C Bus

The printer features a printhead maintenance system used to clean the printhead faceplate and clear clogs from the printhead nozzles. (Refer to Figure 1-6.) The system consists of a vacuum pump assembly, the cap/wipe/purge assembly, the cap/wipe/purge carriage drive, the purge hose and tubing, and the purge filter.

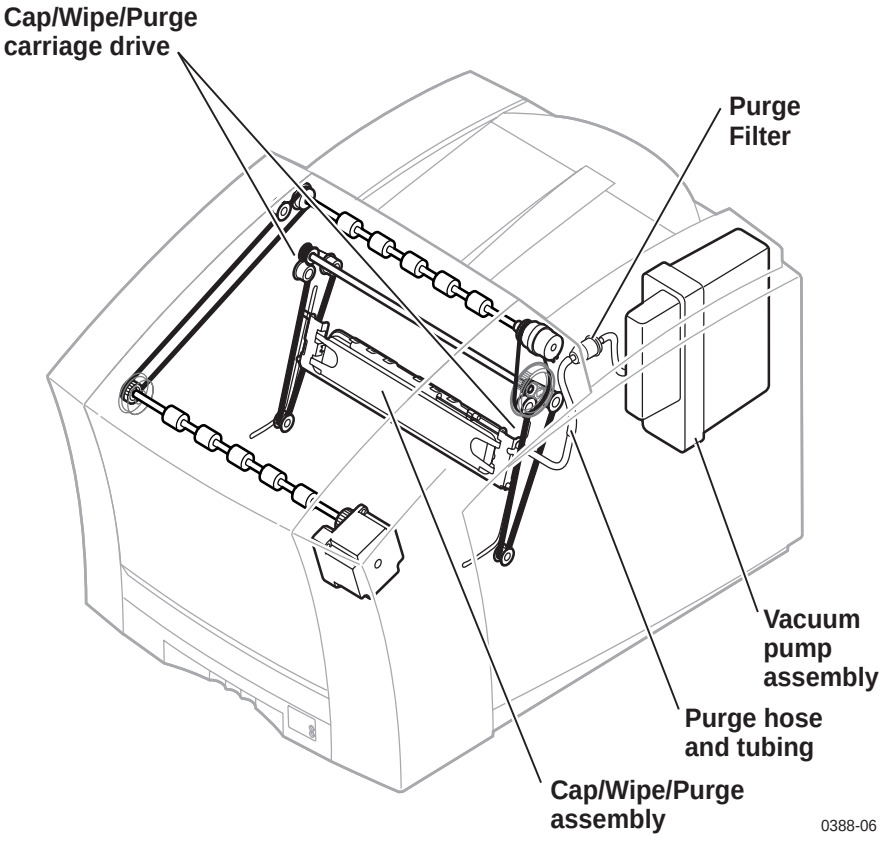


Figure 1-6. Printhead Maintenance System

Sensors in the printer provide information to the main board to determine the state of the printer. The printer monitors the positions of some of the movable assemblies, such as the drum, as well as the temperature of many other assemblies, such as the printhead, paper preheater and the drum. Figure 1-7 shows the sensors and switches on the right side of the print engine. Figure 1-8 illustrates the sensors and switches on the left side of the printer.

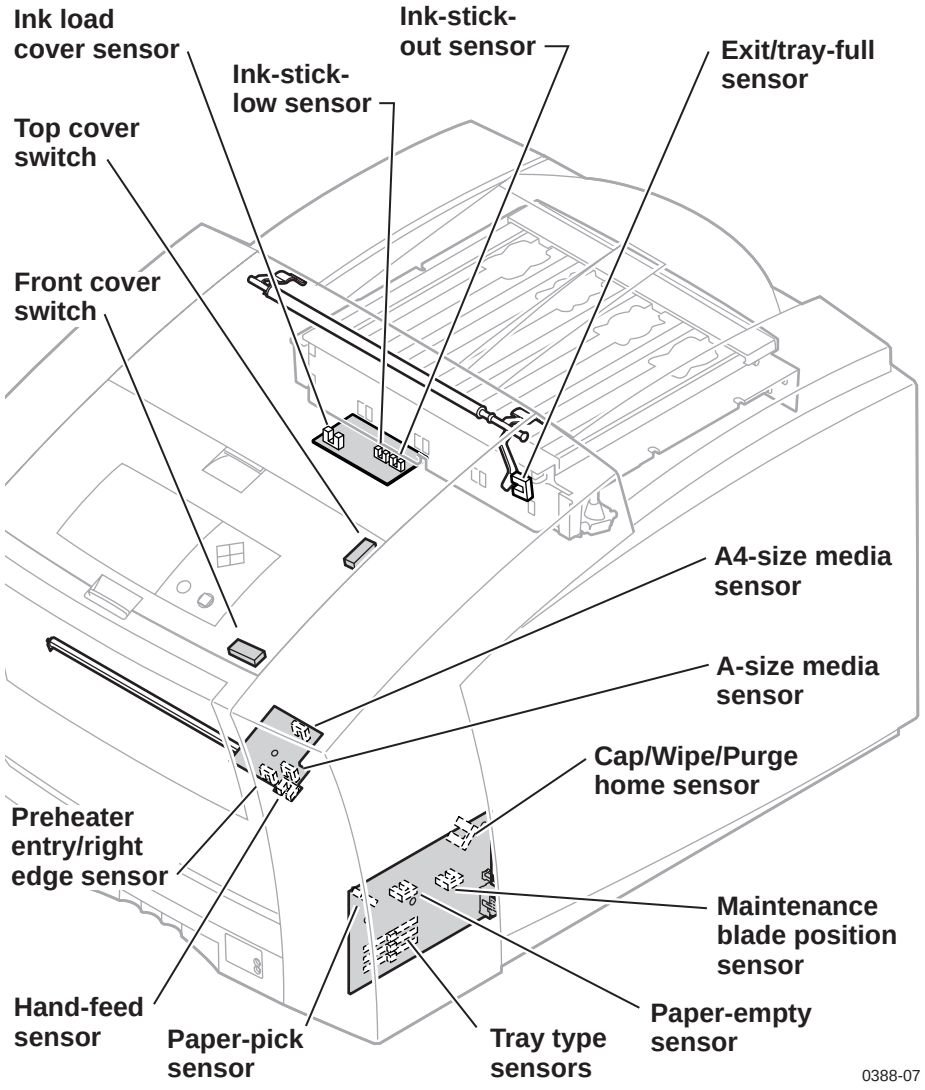


Figure 1-7. Sensors and Switches on the Right Side of the Print Engine

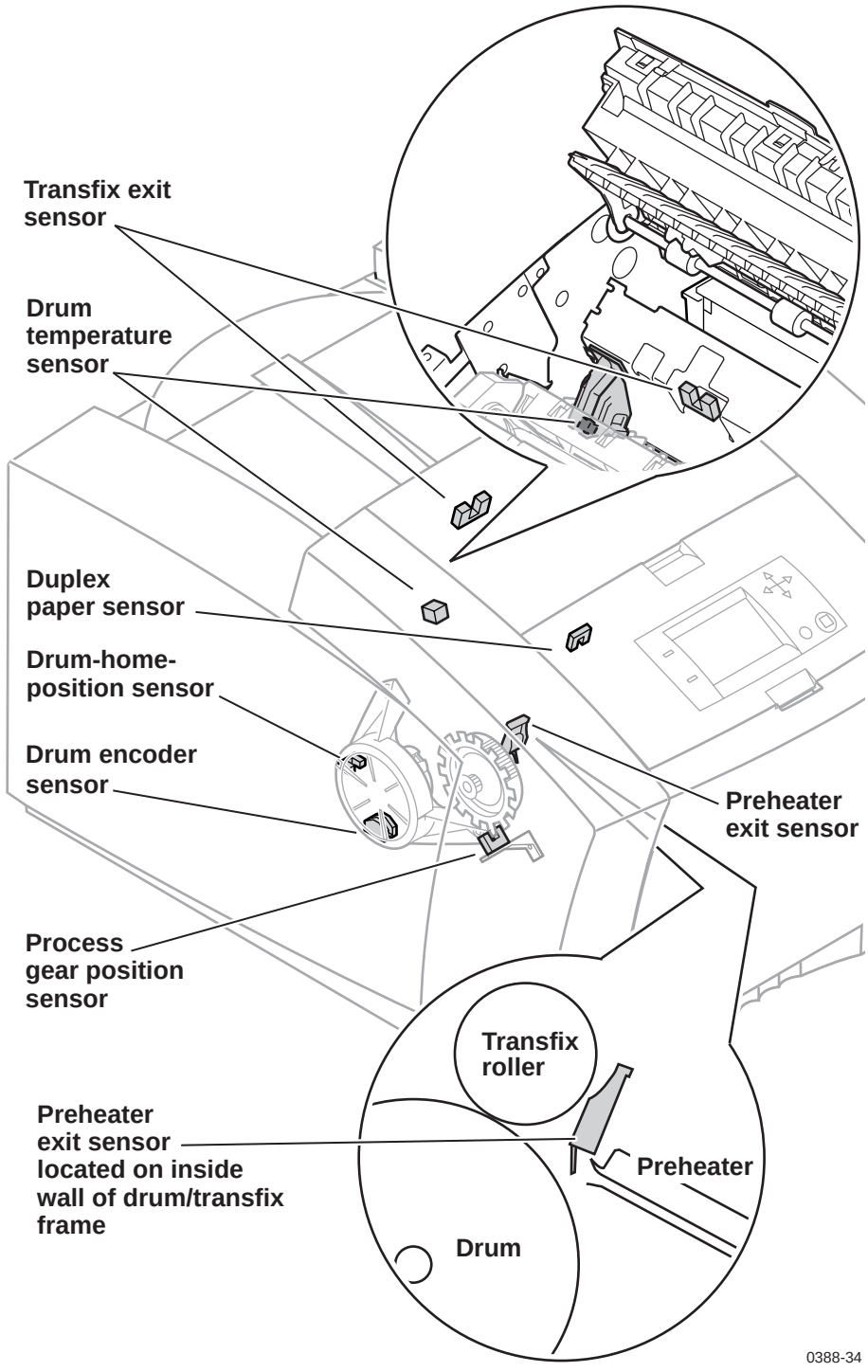


Figure 1-8. Sensors and Switches on the Left Side of the Printer

CAUTION

The actual position of some printer assemblies, such as the printhead or the cap/wipe/purge assembly, cannot be ascertained at all times. The printer records, in NVRAM, where it last positioned such assemblies each time it moves them. If, after power-down or a power interruption, the assemblies are manually repositioned, the printer erroneously assumes that the assemblies are in the position it last left them. This assumption can result in damage to the printer when it tries to position the assemblies. For example, the printhead could be tilted forward and crash into the raised cap/wipe/purge assembly.
Before turning on the printer, ensure the printhead is tilted forward, centered in front of the drum and the cap/wipe/purge assembly is in the retracted, home position. The tilt cam gear should be disengaged from the gear drive train.

Electric clutches and solenoids are used by the printer to engage rollers as needed to move paper through the printer as well as start some print processes. Refer to Figure 1-9.

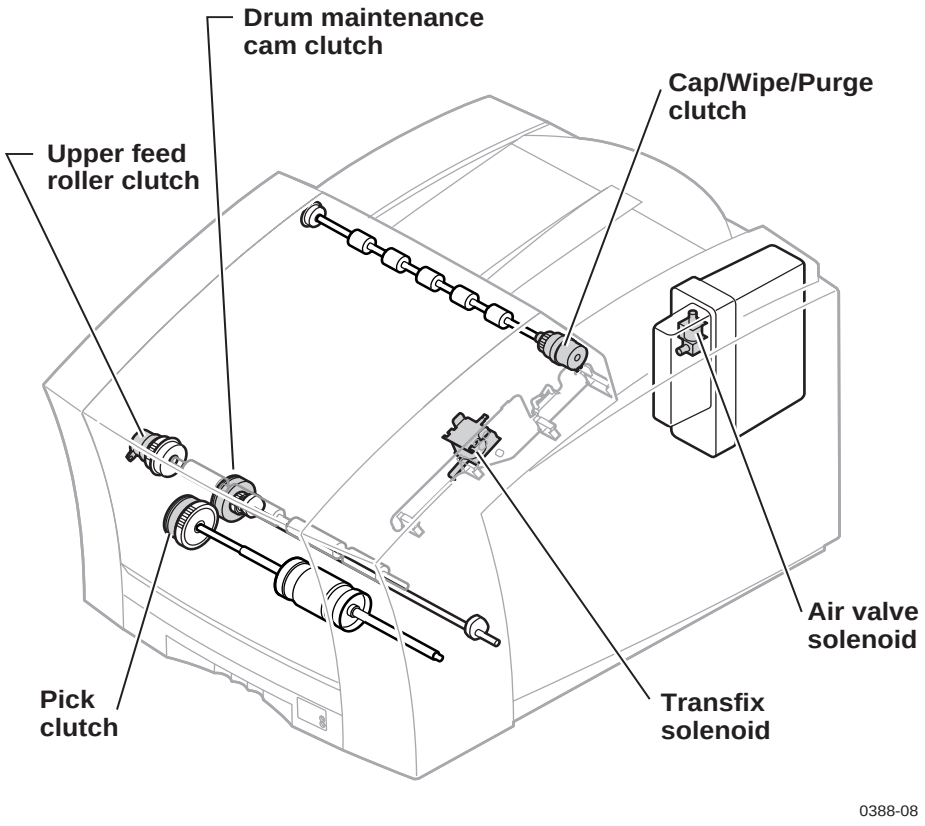


Figure 1-9. Solenoids and Clutches on the Print Engine

The Main Board

The main board features the printer's PowerPC processor that controls the engine and the PostScript processing. Refer to Figure 1-10. Prominent on the main board is the code ROM DIMM and the RAM DIMM plug-in modules. The code ROM DIMM also contains the printer's on-board fonts. Variations of the code ROM DIMM contain alternate language fonts such as Kanji or Hangul.

Network connection is provided through a built-in 10baseT port.

The printer stores unique printer status and PostScript values in its NVRAM module. The printer's Ethernet address, unique to each printer, is stored in Boot ROM/Printer ID chip, an 8-pin socketed IC in location U390. All these socketed components should be transferred to a replacement main board to maintain customer-unique settings.

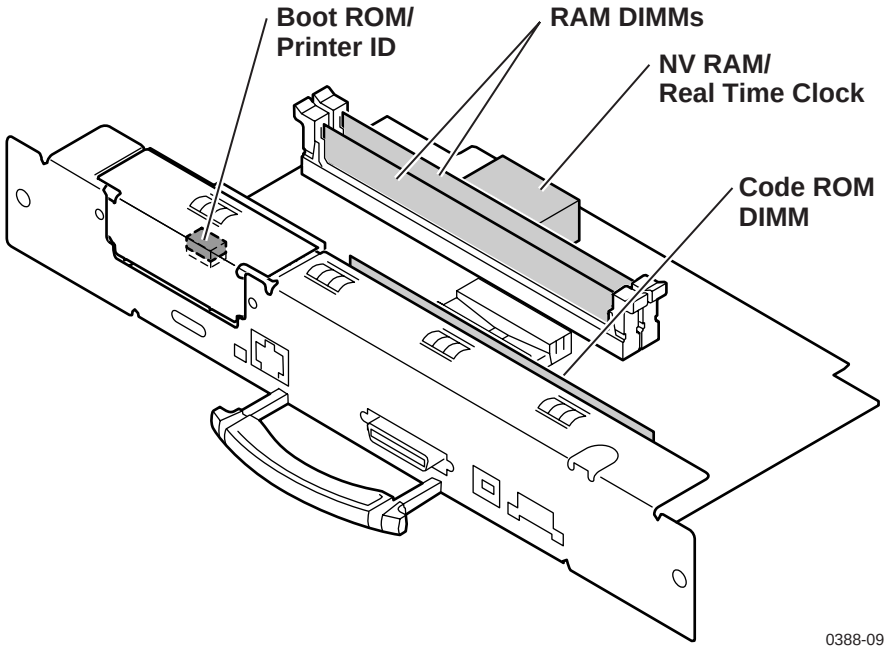


Figure 1-10. Features of the Main Board

Media Tray Type Sensing

The combinations of the three tray sensors inform the print engine what type of media tray (A or A4) is installed. These combinations are shown in Table 1-2. The print engine does not detect the type of media installed in the tray; it only detects the particular tray being used by the presence of sensor flags on the side of the tray. The tray sensors are located on the right-side interior of the paper tray slot, mounted on I/O board right. There are two tray types:

- **Letter (A-size).** This tray is sized for 8.5 x 11-inch (U.S.) paper.
- **Metric Letter (A4-size).** This tray is used for 210 x 297 mm (Metric) paper.

Table 1-2. Tray Switch Sensor Combinations

	Tray type	
	A Paper	**A4 Paper**
Top switch	Closed	Open
Middle switch	Open	Closed
Bottom switch	Open	Open

Front Panel

These front panel features (shown in Figure 1-11) are found on the printer:

- 128 x 64 pixel backlit LCD graphic display
- Two push buttons and four navigation arrow buttons
- Two LEDs (Power and Error)

LCD. The backlit LCD serves two purposes: displaying current image processor and print engine status information and displaying an interactive menu. Status information includes image processor status such as Ready to Print, Receiving Data and Printing. Print engine status includes messages such as Out of Paper, Paper Jam and Add Ink as well as error messages.

Customers can review and modify certain NVRAM, I/O ports and peripheral parameters. Using the front panel to review and change parameters is discussed in the topic, “Adjustments”.

Buttons. Four of the six buttons are arranged as a diamond-shaped keypad. The other two buttons are used as Select and Help.

In the Service Support menu, pressing and holding the **Left arrow** button , and then pressing the **Select** button enters the hidden service support menu.

Pressing and holding the **Right arrow** button and then pressing the **Select** button proceeds immediately to the language selection menu.

Pressing and holding the **Left arrow** while turning off the printer will confirm the printhead is correctly parked by flashing both front panel LEDs.

Turning the printer on with the rear panel DIP switch 2 in the "down" position, allows access to the front panel during the warm-up cycle.

The topic "Resetting NVRAM" explains how to use the front panel buttons to reset the NVRAM to its factory-default values.

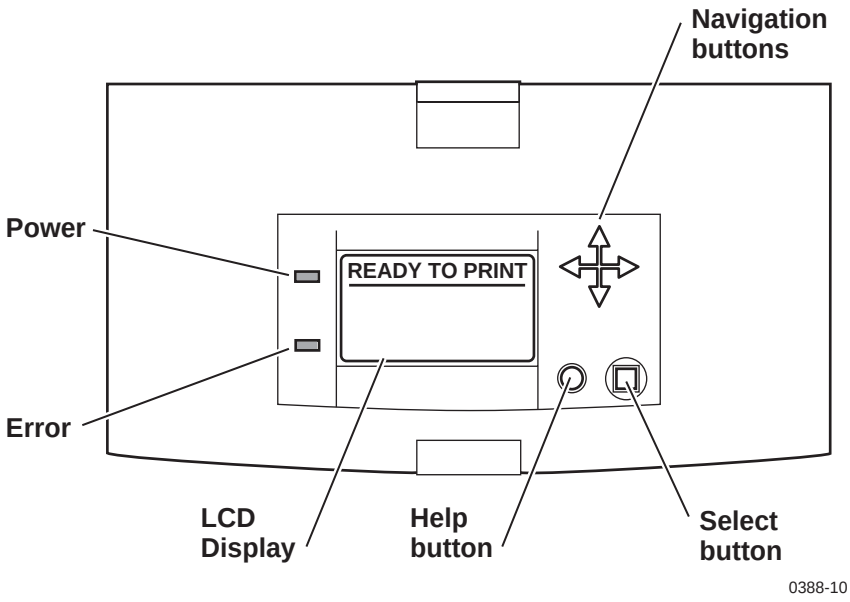


Figure 1-11. Printer Front Panel

Rear Panel

Connectors

The rear panel (Figure 1-12) of the printer features the host interface connectors to the printer; it includes the following connectors:

- Standard parallel (high-density connector), IEEE 1284C
- Twisted Pair (10BaseT) Ethernet connector
- Universal Serial Bus port
- A special 5-pin connector accommodates a service RS-232 cable from a PC running PC-based diagnostics.

The rear panel also includes two option slots. With the addition of an optional Ethernet Interface network card in the lower slot, the printer can support 10Base2 or 100BaseT Ethernet connectors.

NOTE: When an optional Ethernet Interface card is installed, the printer's built-in 10BaseT Ethernet port is disabled.

The second slot accommodates an internal IDE hard drive for print DICOM support.

Health LEDs

Two health LEDs indicate the status of the printer's CPU functions: PostScript (PS) processing and Print Engine (PE) control.

- *Blinking*: The printer is operating normally. Both LEDs blink irregularly during diagnostics. To indicate the printer passes the POST tests and is operating normally, the left (PS) LED flashes in a "heartbeat" rhythm (on 0.5 seconds, off 0.5 seconds). The right (PE) LED pattern is two quick flashes on, then off for a count of two for a total cycle time of just over two seconds.

  If a soft error occurs, image processing occurs, but in a reduced capacity. Soft errors include failure of expansion memory DIMMs or of any of the interface ports. When a soft error occurs, the printer automatically prints a startup page listing the error.

- *On* or *Off, or blinking a coded error indication*: A hard error condition has occurred that would keep the image processor board from operating. Refer to the topic "Error Codes and Messages" for the meaning of a coded indication.

Switches

Four DIP switches allow you to reset the printer or place the printer in different operating modes. Figure 1-12 illustrates the rear panel of the printer and location of the DIP switches.

Table 1-3. Rear Panel DIP Switch Settings

Function	Switch 1	Switch 2	Switch 3	Switch 4
Normal operating mode	UP	UP	UP	UP
Service mode	DOWN	UP	UP	UP
Reset printer	UP	UP	UP	DOWN
Manufacturing mode (Bypass mode)	UP	DOWN	UP	UP
Development mode (engineering use only)	DOWN	DOWN	DOWN	UP
Recovery mode (engineering use only)	DOWN	UP	DOWN	UP

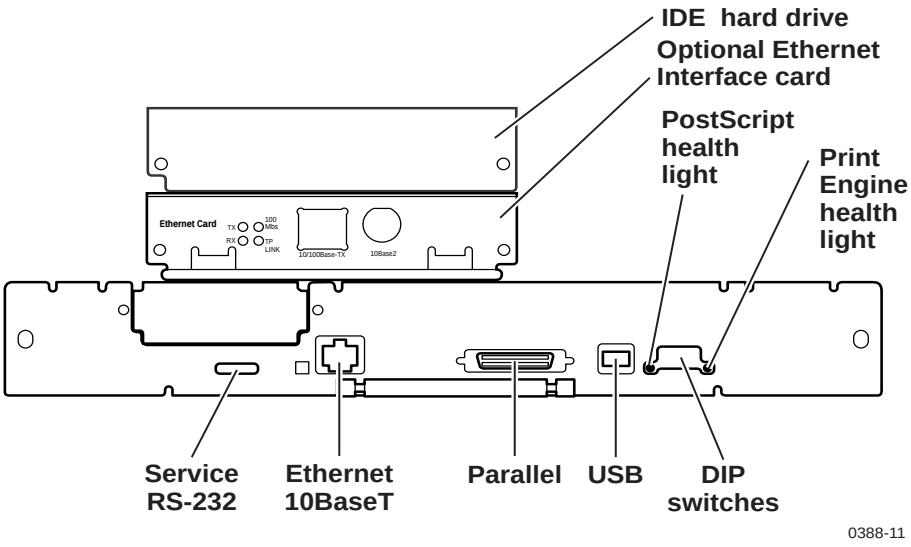


Figure 1-12. Rear Panel

Bypass Mode (Manufacturing Mode)

Bypass mode allows you to access the front panel menus (bypassing the engine and PostScript initializing processes) without having to wait for the printhead to warm up. This way, you can observe or change some of the printer settings without waiting for the printer to complete the normal warm up sequence. Meanwhile, the printer continues to warm-up and initialize "in the background."

1. At the rear of the printer, set DIP Switch 2 in the *down* position. Ensure Switches 1, 3 and 4 are up. (Normal operation is all switches up.)
2. Turn on the printer.

The printer will not print a Cleaning Page or a Startup Page when placed in Bypass Mode.

Cool Down Mode

The printer features a menu item that accelerates the cooling down of the printhead. When the printer is turned off, it automatically gives the option of performing a quick cool down.

1. Turn off the printer.
2. Scroll to the menu item Quick Cool to Move and press the **Select** button.
3. Open printer doors to help speed the cooling process.

The printer turns off all the engine heaters and runs the fans on high until the ink in the printhead has solidified. Then the printer shuts itself off.

Preparation for Moving the Solid Inkjet 100 Printer and Accessories

It is very important that you follow the correct repacking procedure before shipping the Solid Inkjet 100 printer. Complete repacking is required. Failure to properly repack the printer can damage the printer's internal components. You are responsible for any shipping damage to the printer that results from improper or inadequate packing.

Repacking for shipment consists of four basic tasks. Each of these tasks is explained in detail. If you have questions regarding any of the repacking procedures, call Sterling for assistance:

Sterling Diagnostic Imaging, Customer Care Center at (800) 252-9099. Outside the U.S. and Canada, contact your local Sterling Diagnostic Imaging service organization.

Overview

After reviewing this section, follow the more detailed processes which follow to complete this task.

1. Turn off the printer using the On/Off switch and then selecting Shut Down For Moving Printer at the front panel.
2. Remove the maintenance drawer, seal it in a plastic bag, and store the tray on a flat surface.

NOTE: A used maintenance drawer leaks drum fluid if tipped.

3. Make sure that the printer has completed its shut down before moving the printer (after approximately 15 minutes, the front panel goes blank). This allows the ink to solidify.
4. Repack the printer and its accessories using the original packing materials.

Turning off the Printer

CAUTION

To avoid damaging the printer's internal components, always turn the printer power off using the On/Off switch (this places the printhead in the proper position for safe shipment). Failure to do so may result in damage to the printer. *Never turn off the printer by pulling the power cord.*

1. Use the rear-panel On/Off switch to turn off the printer.
2. At the front panel, immediately select Quick Cool to Move Printer (you have 4 seconds before the display goes blank).

The printer reports the shut down status and takes approximately 15 minutes to cool down. While it is cooling, it is recommended that you remove the maintenance drawer (see the next topic).

CAUTION

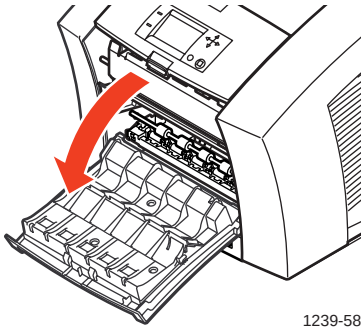
If you do not select Quick Cool to Move Printer, you must wait 30 minutes for the ink to solidify. Before moving the printer, always wait for the ink to solidify or you may damage the printer.

Removing the Maintenance Drawer

CAUTION

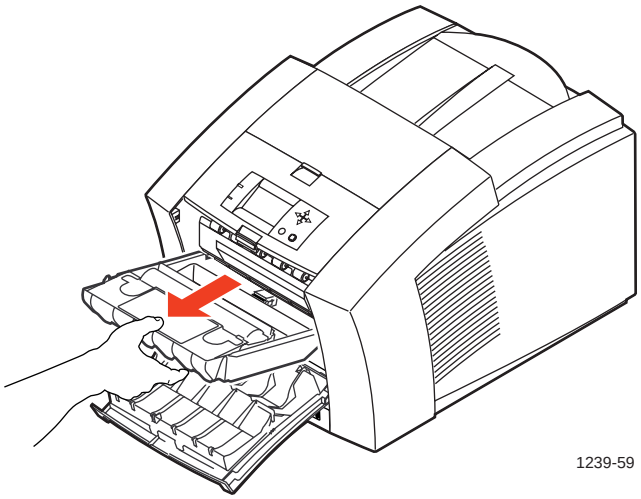
To avoid damaging the printer, always remove the maintenance drawer before moving or shipping the printer. Never ship a partially used maintenance drawer.

1. Open the printer's front cover.



1239-58

2. Remove the maintenance drawer from the printer. Once you've removed the maintenance drawer, keep it level.



WARNING

A used maintenance drawer leaks drum fluid if tipped. Keep the maintenance drawer level to prevent spills. Contact with maintenance drawer fluid poses no health risk, however, do not leave the used maintenance tray where it could spill and create a slipping hazard.

3. Place the used maintenance drawer in a plastic bag and seal the bag. Store the used maintenance drawer for future use. **Do not ship a partially used maintenance drawer.**

Disconnecting the Cables

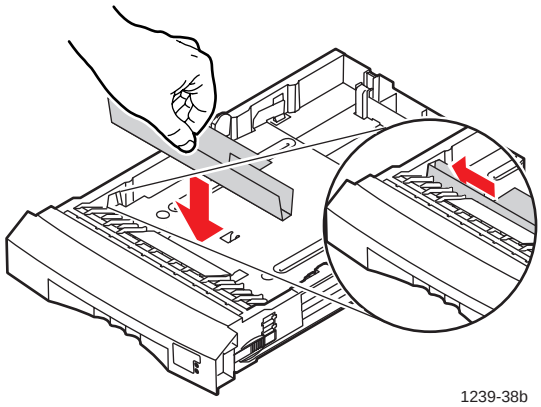
Once the printer completes its shut down process, the front panel goes blank. Once this happens, disconnect the power cord and all other cables from the printer.

Repacking the Printer and its Accessories

WARNING

The printer weighs about 36 kg (79 lb.). Do not attempt to lift it without the assistance of another person.

1. Repack the media tray. Remove the media trays and remove all media from the trays. Position the cardboard tray insert into the media tray to prepare it for shipping. Reinsert the media tray into the printer.



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2. Repack the printer. Position the lower cushion insert in the shipping tray as shown in the illustration. Lower the printer onto the cushion inserts. Place the plastic bag provided over the printer. Place the cushion inserts on each side of the printer.

3. Repack the printer's accessories. Place the power cord, cleaning kit, and all printer documentation in the area provided in the accessories box. Do not ship a partially used maintenance drawer.

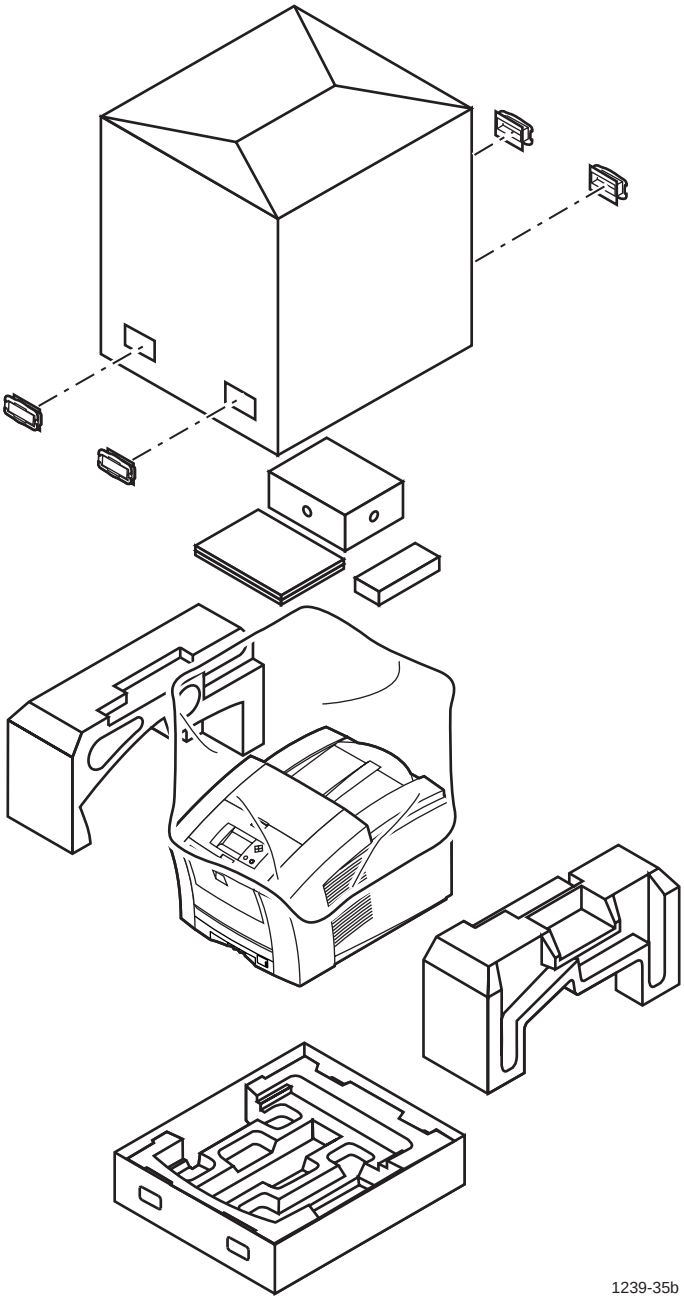


Figure 1-13. Repacking the Printer

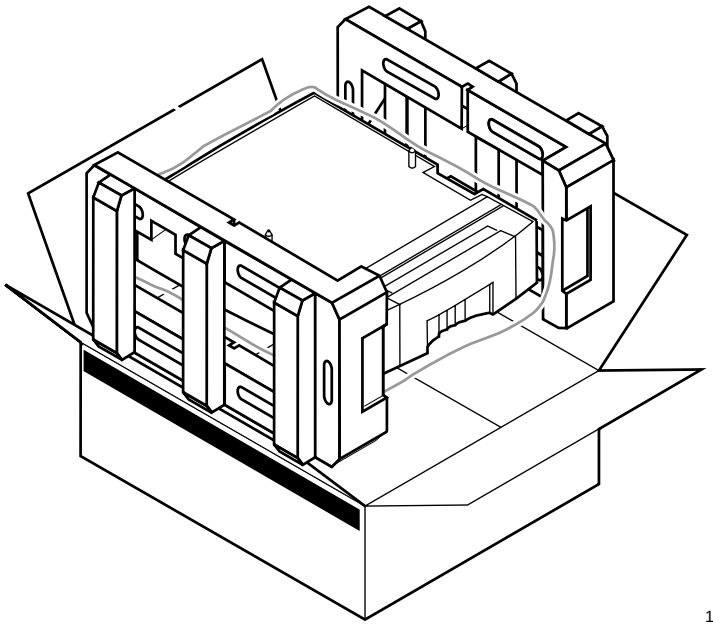
WARNING

The printer is not permanently attached to the Auxiliary Feeder unit. When moving the printer or auxiliary feeder unit, move each unit separately to avoid damage or personal injury. The printer weighs about 36 kg (79 lb.). Do not attempt to lift it without the assistance of another person.

Repacking the Auxiliary Feeder Unit

If you have an Auxiliary Feeder unit, repack for shipment using the original packaging.

Remove the media tray from the Auxiliary Feeder unit and remove all media from the tray. Slide the media tray into the Auxiliary Feeder unit and place the assembly inside the plastic shipping bag. Place the front and rear cushions on the Auxiliary Feeder unit. Place the entire assembly into the cardboard box.



1239-01

Configuration Page

The configuration page, shown on pages 1-27 and 1-28, lists the values the printer stores in its NVRAM. These values can be informative when troubleshooting the printer, particularly networked operations. The configuration page gives information such as:

- General information about the printer, such as page count, the programmed name, Ethernet address, time-outs, number of fonts and total memory
- Printhead information such as serial number, calibration and adjust values
- Parallel port settings
- USB setting
- Hard drive
- Network information
- EtherTalk settings
- Novell NetWare settings
- TCP/IP settings

Configuration page settings are provided in Table 1-4.

Printing the Configuration Page

1. Turn on the printer.
2. Allow the printer to complete its power-up self-tests. The front panel displays:

   `READY TO PRINT`

3. Scroll to **Menu** and press the **Select** button.
4. Scroll to the menu item **Demo and Test Pages** and press the **Select** button.
5. Scroll to the menu item **Print Configuration Page** and press the **Select** button.

Configuration

STERLING®
Diagnostic Imaging

General Information

Printer Name:	iiLINX SIJ 100
Total Page Count:	810
Upper Tray Paper Pages:	675
Lower Tray Paper Pages:	135
Start Page Enabled:	Yes
Serial Number:	B0PP030
Product:	*ii*LINX solid inkjet 100
Printer ID:	08:00:11:0A:50:3B
Adobe® PostScript®:	3010.106 (7)
Firmware Versions:	OS 1.4 / PS 11.28 / Eng 11.28 / Net 10. 92.06.14.1999
Flash Installed:	Yes
Installed RAM:	64 MBytes
Memory Slot 1:	SDRAM / Non-Parity / 32 MBytes / KMM3 66S 403CTL-G0
Memory Slot 2:	SDRAM / Non-Parity / 32 MBytes / 16LSDT464AG-662C1
ROM Fonts Available:	136 Fonts
Sys/Start Job:	Run
Job Timeout:	Unlimited
Wait Timeout:	40 seconds
Energy Star Timeout:	30 hours
Media Source:	Lower Tray
Upper Tray:	Paper, Letter
Lower Tray:	Paper, Letter

Print Quality	High Resolution Medical
Custom LUTs	None

Parallel Port	Enabled
Language:	PostScript®
Encoding:	Binary
Job Pipelining:	Off
Output Device:	Parallel Port
Handshake:	Bi-directional

USB	Enabled
Language:	PostScript®
Encoding:	Binary
Job Pipelining:	Off

IDE Disk	Not Connected

Network Information

Version:	10.92x
Time:	Fri Jul 02 11:58:08 1999
Time Source:	Clock not set
Last Config Time:	Tue Apr 27 08:08:08 1999
SysAdmin Contact:	
Printer Location:	

PhaserShare® Series B Built-In Ethernet® Interface

Network Address:	08:00:11:0a:50:3b

EtherTalk®	Enabled
Language:	PostScript®
Filtering:	None
Job Pipelining:	On
Name:	iiLINX SIJ 100
Printer Type:	LaserWriter
Zone:	GG-ENET
Network.Node:	8248.11

IPX	Enabled
IPX Networks:	
Ethernet_802.2:	00000000
Ethernet_802.3:	00000000
Ethernet_II:	00000000
Ethernet_SNAP:	00000000

NetWare®	Enabled
Language:	PostScript®
Filtering:	None
Job Pipelining:	On
Operating Mode:	Print Server
Print Server Name:	TEK0A503B
Connection Mode:	Directory Services
Preferred DS tree:	
Login Password:	Not Set
Enable Banners:	False
Config Retry Interval:	60 seconds
Queue Scan Interval:	15 seconds
Status Message:	Can't find NDS tree, will retry in 60 sec

TCP/IP	Enabled
Host Name:	phaser
IP Address:	192.168.1.20
Network Mask:	255.255.255.0
Router/Gateway:	192.168.1.11
Frame:	Ethernet_II
RARP:	Disabled
BOOTP/DHCP:	Disabled
IP Address Source:	Front Panel
SMTP Server:	
SMTP Reverse Path:	

DNS	Disabled

STERLING®
Diagnostic Imaging

Configuration

LPR	Enabled
Filtering:	None
Job Pipelining:	On
Host Access List:	
AppSocket	Enabled
Language:	PostScript®
Filtering:	None
Job Pipelining:	On
Host Access List:	
Syslog	Disabled
SNMP	
Trap Host:	
Authentication Traps:	False
HTTP	Enabled
Local URL Address:	
HTTP Password:	Not Set
Refresh Delay:	60 seconds
FTP	Enabled
Language:	PostScript®
Filtering:	None
Job Pipelining:	On
Login Password:	Not Set
Remote Internet Printing	Enabled
Language:	PostScript®
Filtering:	None
Job Pipelining:	On
POP3 Server:	
POP3 User Name:	
POP3 Password:	Not Set
POP3 Polling Interval:	3 minutes
Printing Password:	Not Set
Authorized Hosts:	
Authorized Users:	

Table 1-4. Configuration Page Settings

Parameter	Description	Saved in NVRAM	Default	Limits or alternate choices
Printer name	The current name of the printer as seen on a network	yes	*i* LINX SIJ100	Any name defined by the customer up to 32 characters in length.
Page count; upper and lower tray counts	Total number of print jobs processed through the image processor.	yes	0	
Startup page enabled	Indicates if the printer prints a startup page upon power-up.	yes	Yes	No
Serial number	Unique number representing the printer serial number	yes		
Product			*i* LINX Solid Inkjet 100	
Printer ID	A unique number for each Ethernet-capable printer.	yes	Hardware-dependent.	Legal values have the form xx:xx:xx:xx:xx:xx
PostScript version	Firmware level of the PostScript interpreter code.	N/A	3016.106	
Firmware version	Firmware levels of the main board operating system code version, printer engine's operating system code, PostScript code, engine code, and networking code.	N/A		a.aa/b.bb/c.cc/d.dd, where a.aa is the Sterling version of VxWorks, b.bb is the PostScript version number, c.cc is the engine code version, and d.dd is the network code firmware version
Flash Installed			Yes	
Installed RAM	Total amount, type, and size of RAM on the main board in each DIMM slot.		64 Mbytes	64, 96,128
ROM fonts available	Number of fonts stored in the printers ROM memory.		136	
Sys/Job Start	Indicates if the printer is to execute a Sys/Start job file found on an attached hard drive at power-up	yes	yes	no
Job Timeout	Amount of time a job can take to process.	yes	0 seconds	Any value denoted in seconds. 0 means unlimited amount of time

Table 1-4. Configuration Page Settings (continued)

Parameter	Description	Saved in NVRAM	Default	Limits or alternate choices
Wait Timeout	Amount of time the image processor waits for additional data from a host.	yes	40 seconds	Any value greater than 14 denoted in seconds; 0 means unlimited amount of time
Energy Star time-out	Amount of idle time allowed before the printer switches to a low energy power down mode.	yes	67 hours	Any integer from 1 to 999 denoting hours.
Intelligent Ready	Indicates if the automatic standby/wake up feature is enabled.	yes	on	off
Media Source	Indicates the default tray the printer uses for self-prints	yes	Upper Tray	Upper Tray, Lower Tray
Upper Tray	Indicates the size and type of tray installed	no		Letter, A4
Lower Tray	Indicates the size and type of tray installed	no		Letter, A4
Print Quality	Indicates the combined setting of the HW Resolution.	yes	High Resolution Medical	High Resolution Medical, Draft
Parallel Port Enabled	Indicates if the parallel port is enabled	yes	Enabled	Disabled
Language	Indicates the language interpreter in use at the port	yes	PostScript	
Encoding	Indicates the type of data encoding at the parallel port	yes	Binary	ACSII (normal), Raw, TBCP
Job pipelining	Indicates if multiple printfile processing is allowed	yes	Off	0n
Output Device	Device used for standard output and standard error	yes	Parallel	any communication device

Table 1-4. Configuration Page Settings (continued)

Parameter	Description	Saved in NVRAM	Default	Limits or alternate choices
Handshake	Setting whether unidirectional or bidirectional communication is used.	yes	Bi-directional	Uni-directional
USB				
Language	Indicates the language interpreter in use at the parallel port	yes	PostScript	
Encoding	Indicates the type of data encoding at the port	yes	Binary	ACSII (normal), TBCP
Job Pipelining	Indicates if multiple printfile processing is allowed	yes	Off	On
IDE Disk	Indicates if the internal hard drive is installed	no		
Size	Indicates the physical size of the installed IDE drive	no		Disk size in Gbytes
Boot Delay	Number of seconds the printer waits before booting up the hard drive.	yes	0	Any positive integer
Polling				
Network Information				
Version				Integer 1 to 255
Time	<day><date><time><year>			
Time Source	Source of the time set in printer, such as a remote computer dialog box		Set at factory	Clock not set

Table 1-4. Configuration Page Settings (continued)

Parameter	Description	Saved in NVRAM	Default	Limits or alternate choices
Last Config Time	Last date the printer's configurations were altered	yes		
SysAdmin contact	Name of system administrator	yes		Empty string
Printer Location	Physical location of printer as set by system administrator	yes		Empty string
PhaserShare	Indicates the type of Phaser Share network card installed	no	Built-in	Ethernet
Network Address	A unique number for each Ethernet-capable printer.	yes	Hardware-dependent. Legal values have the form xx:xx:xx:xx: xx: xx	
EtherTalk	Indicates the type of interpreter in use at the port.	yes	PostScript Level 2	Not installed, Disabled, <interpreter> enabled
Language			PostScript	
Filtering	Interpretation of special characters	yes	None	
Job Pipelining	Indicates if multiple printfile processing is allowed	yes	Off	On
Name	The current name of the printer as seen on a network	yes	*Ii* LINX SIJ 100	Any name defined by the customer up to 32 characters in length.
Printer type	Indicates the type of printer installed at the port.		LaserWriter	Any string, 32 character or less
Zone	Name assigned by network administrator for the zone the printer is assigned to.	yes		Any string, 32 characters or less
Network Node				

Table 1-4. Configuration Page Settings (continued)

Parameter	Description	Saved in NVRAM	Default	Limits or alternate choices
IPX	Indicates which IPX frame types the printer accepts			
IPX Networks				
Ethernet 802.2		yes	Enabled	Disabled
Ethernet 802.3		yes	Enabled	Disabled
Ethernet II		yes	Enabled	Disabled
Ethernet SNAP		yes	Enabled	Disabled
NetWare port interpreter				
Language	Indicates the type of interpreters in use at the port.	yes	PostScript	Disabled, <interpreter>
Filtering	Interpretation of special characters	yes	None	Interpreter-based
Job pipelining	Indicates if multiple printfile processing is allowed	yes	On	Off
Operating Mode			Print server	
Print Server Name	Name of printer server.	yes	TEK01B009, hardware dependant	*user-defined*
Connection Mode	1 - Directory Services, 2 - Bindery 3 - Directory and Bindery Services	yes	2 - Bindery	1 - Directory Services, 3 - Directory and Bindery Services
Preferred DS Tree	Directory Services Tree where printer initially connects	yes		Max length 48 bytes

Table 1-4. Configuration Page Settings (continued)

Parameter	Description	Saved in NVRAM	Default	Limits or alternate choices
Login Password	Indicates whether or not a network password has been set.	yes	Not set	Set, Not set
Enable Banners	Print banner	yes	No	
Config Retry Interval	Time in seconds to wait before retrying to configure	yes	60 seconds	
Queue Scan Interval	Rate at which printer will scan queue for print jobs.	yes	15 seconds	An integer 1 through 300 in seconds
Status Message				
TCP/IP port interpreter	Indicates the type of interpreter in use at the port.	yes		Not authorized, Disabled
Host Name				
IP Address	The Internet Protocol address. If null, the address will be set at run time via RARP or BOOTP.	yes	Not Set	String of 15 or fewer characters of the format N.N.N.N followed by the word “Dynamic” if IP Address Dynamic parameter is set to true.
Network Mask	Indicates which fields of the IP Address designate the network portion and which designate the node portion. If null, the mask will be determined from the printer’s IP address or the BOOTP or ICMP Netmask Reply.	yes	Default	String of 15 or fewer characters of the format N.N.N.N
Router/ Gateway	A list of addresses of the gateways to other networks.	yes	None	String of 15 or fewer characters of the format N.N.N.N
Frame	Data packet encapsulation type for ARP/ RARP requests and IP datagrams.	yes	DIX	Adaptive, 802.2-SNAP. May be followed by the word “Dynamic”
RARP	Reverse Address Resolution Protocol/ Boot Parameter Protocol. Used for setting the printer’s IP address from a boot server.	yes	False	True

Table 1-4. Configuration Page Settings (continued)

Parameter	Description	Saved in NVRAM	Default	Limits or alternate choices
BOOTP/ DHCP	Used for setting the printer's IP address from a boot server	yes	False	True
IP Address Source	Indicates from what source the IP address was obtained	yes		
SMTP Server	Host that email notification will deal with	yes	Empty field	16 characters
SMTP Reverse Path	Destination of email error messages	yes	Empty field	80 characters
DNS				
Primary Server	Provides the IP address of the primary Domain Name Services server		None	This is overridden by BOOTP/ DHCP
Secondary Server	Addition source of IP address for a Domain Name Services server		None	
Search Domain Names(s)	Local domain name of DNS resolver		None	256 characters
LPR				
Filtering	Interpretation of special characters	yes	None	Interpreter-based
Job pipelining	Indicates if multiple printfile processing is allowed	yes	yes	no
Host Access List	List of TCP/IP network addresses for host access to printer	yes		Unrestricted
AppSocket port interpreter				

Table 1-4. Configuration Page Settings (continued)

Parameter	Description	Saved in NVRAM	Default	Limits or alternate choices
Language	Indicates the type of interpreter in use at the System V configured port.	yes	PostScript	
Filtering	Interpretation of special characters	yes	None	Interpreter-based
Job pipelining	Indicates if multiple printfile processing is allowed	yes	On	Off
Host Access List	List of TCP/IP network addresses for host access to printer	yes		Unrestricted
Syslog	Protocol that acts as a remote front panel to the printer.	yes		Not Authorized, <null string>
Log Hosts	List of address of host that want to receive syslog messages.	yes	Send no messages	List of IP addresses in the format N.N.N.N
Log Priority	The threshold indicating the priority level of messages from the printer that will be sent to the list of log host(s).	yes	5	0 – unit is no longer usable, 1 – messages indicating action is needed on part of system administrator, 2 – critical error messages, 3 – error message, 4 – warning messages, 5 – normal but significant message, 6 – informational messages, 7 – debugging messages
SNMP	Allow the printer to respond to status queries from host-resident SNMP utilities.	yes		Not Authorized, <null string>
Trap Hosts	A list of hosts, one for each protocol, which are able to receive traps.	yes	None	None, N.N.N.N/Public, N.N.N.N/Proxy, N.N.N.N/ Private, N.N.N.N/Regional, N.N.N.N/Core
Authentication Failure Traps	If enabled, the printer sends a trap for SNMP authentication failure.	yes	Enabled	Disabled

Table 1-4. Configuration Page Settings (continued)

Parameter	Description	Saved in NVRAM	Default	Limits or alternate choices
HTTP	Indicates if HTTP support has been enabled	yes	Enabled	Disabled
Local URL Address		yes		
HTTP Password		yes	Not set	Set
Refresh Delay		yes		
FTP				
Language	Indicates if FTP support has been enabled	yes	Auto Select	Not Authorized, Disabled, <interpreter>
Filtering	Interpretation of special characters	yes	None	Interpreter-based
Job pipelining	Indicates if multiple printfile processing is allowed	yes	yes	no
Login Password		yes	Not set	Set
Remote Internet Printing	Indicates of remote printing, PhaserLink printing, is enabled		Not Enabled	Enabled
Language	Indicates the language interpreter in use at the parallel port	yes	PostScript	
Filtering	Interpretation of special characters	yes	None	
Job Pipelining		Yes	On	Off
POP3 Server IP Address	Backup SMTP server IP address	yes	Empty field	
POP3 User Name	POP3 login user name	yes	Empty field	40 byte field
POP3 Password	POP3 login password	yes	Empty field	40 byte field

Table 1-4. Configuration Page Settings (continued)

Parameter	Description	Saved in NVRAM	Default	Limits or alternate choices
POP3 Polling Interval	Interval printer waits before checking for new mail	yes	3 minutes	1 to 32767
Printing Password	Password required for using internet printing feature	yes	Not Set	Set
Authorized Hosts	List of host connections allowed to use internet printing feature	yes	Empty field	256 byte field
Authorized Users	List of email names allowed to use internet printing feature	yes	Empty field	256 byte field

Specifications

Physical Dimensions

Table 1-5 provides the printer dimensions. Table 1-6 provides the printer clearance requirements.

NOTE: The printer must be mounted on a surface that is flat within 2 degrees of horizontal. All four of the printer's feet must be in contact with the mounting surface.

Table 1-5. Printer Dimensions

	Printer	Auxiliary Feeder Unit	Cart
Height	38.8 cm (15.3 in.)	12.7 cm (5.0 in.)	47.6 cm (18.75 in.)
Width	43.2 cm (17.0 in.)	43.2 cm (17.0 in.)	45.7 cm (18.0 in.)
Depth	59.7 cm (23.5 in.)	59.7 cm (23.5 in.)	55.2 cm (21.75 in.)
Weight	36.0 Kg (79 lbs.)	11.8 Kg (26 lbs.)	23.4 Kg (51.5 lbs.)

Table 1-6. Printer Installation Clearances

Top	45.7 cm (18 in.)
Left	10.2 cm (4 in.)
Right	10.2 cm (4 in.)
Front	Clearance must be sufficient to replace trays and clear paper jams.
Rear	10.2 cm (4 in.)
Bottom	No obstruction under printer that could block its cooling vents.

Functional Specifications

Printing process	Solid inkjet onto plain paper
Grayscale ink sticks	Clear, low-, medium- and high-density ink sticks, each shape-coded
Print Quality	Selectable 409 x 409, or 600 x 600 dpi (horizontal and vertical)
Engine printing speed	

NOTE: Engine printing speed measures the elapsed time from loading to ejecting the paper. Print times do not include image processing time, which varies according to image complexity.

	Draft mode (409 x 409 dpi) Approximately 12.8 sec. for A or A4 size
	High Resolution Medical mode (600 x 600 dpi) Approximately 25 sec. for A or A4 size
Minimum printing margins	Top and bottom 5 mm (0.2 in.)
	Left and right sides 6.5 mm (0.26 in.)
Maximum print area	A size: 8.1 x 10.5 in.
	A4 size: 200 x 284 mm

Electrical specifications

WARNING

Do not use extension cords of any length or gauge.

Primary line voltages	87–132 VAC (115 VAC nominal) 174–264 VAC (220 VAC nominal) Input voltage range is auto-sensed.
Primary voltage	47–63 Hz frequency range
Power consumption	200 watts standby 300 watts at idle 600 watts during printing Maximum power consumption is 1000 watts during warmup.
Current rating	115 VAC configuration: 8 amp max./1 amp min. 220 VAC configuration: 4 amp max./1 amp min.
Fusing	

NOTE: Fuses are not user-accessible.

	F1: (DC switcher) 6.3-amp slo blo F2: (Drum heater 1, reservoir heater 1, ink melt chambers, cap/wipe/purge unit) 10-amp slo blo F3: (Jet stack left and right, paper pre-heaters, reservoir heaters 2, 3 and 4) 10-amp slo blo
Secondary voltages	+5V ± 2.5% +12 V ± 5% -12 V ± 5% +40 V -5%, +12% -52 V ± 10% +54 V ± 10%

CAUTION

Operate printer only within specified environmental ranges.

Environmental specifications

WARNING

If combustible fluids are brought into contact with hot elements of the printer, evacuate the area and call for service personnel.

Temperature	Operating 15-32 C° (59 to 90° F) Storage and shipping -30 to 60° C (-22 to 140° F)
Humidity	Operating 15 to 80% relative humidity, non-condensing Nonoperating 15 to 95% relative humidity, non-condensing
Altitude	Operating 0 to 2400 m (8,000 ft.) at 25°C Nonoperating 0 to 15000 m (50,000 ft.)
Vibration/shock	Nonoperating (vibration) Will withstand 0.5 G excitation, 5 to 500 Hz, 3 axes for up to 7 minutes with no impairment or subsequent damage. Nonoperating (shock) 0.5 g, 25 minute sweep, 5-200-5 Hz, 100–200 sec./sweep cycles Operating (shock) The printer may have any corner raised and dropped 1.5 cm (0.6 in.) while printing is in progress, without impairment of operation that cannot be recovered by a printhead purge cycle. The printer may

have any corner raised and dropped 6 cm (2.4 in.) while idle without subsequent impairment of operation.

Operating (drop)
Printer only with the main tray installed; maintenance drawer installed; printhead unlocked; no internal packaging: 0.5 in for one drop on all four bottom edges

Printer in “Ready” mode and at operating temperature: 1.0 in. drop on all four bottom edges

Theory of Operation

This topic covers the following subassemblies and diagram within the printer:

- Functional block diagram
- Drum/transfix assembly
- Maintenance drawer
- Printhead
- X-axis movement
- Printhead tilt mechanism
- Ink loader
- Cap/wipe/purge assembly
- Power supply
- Power control board
- Main board
- Optional Ethernet interface card (100 BaseT)
- Optional internal disk drive
- Print process in operation
- Printhead maintenance cycle

Functional Block Diagram

Figure 1-14 presents a functional block diagram of the printer.

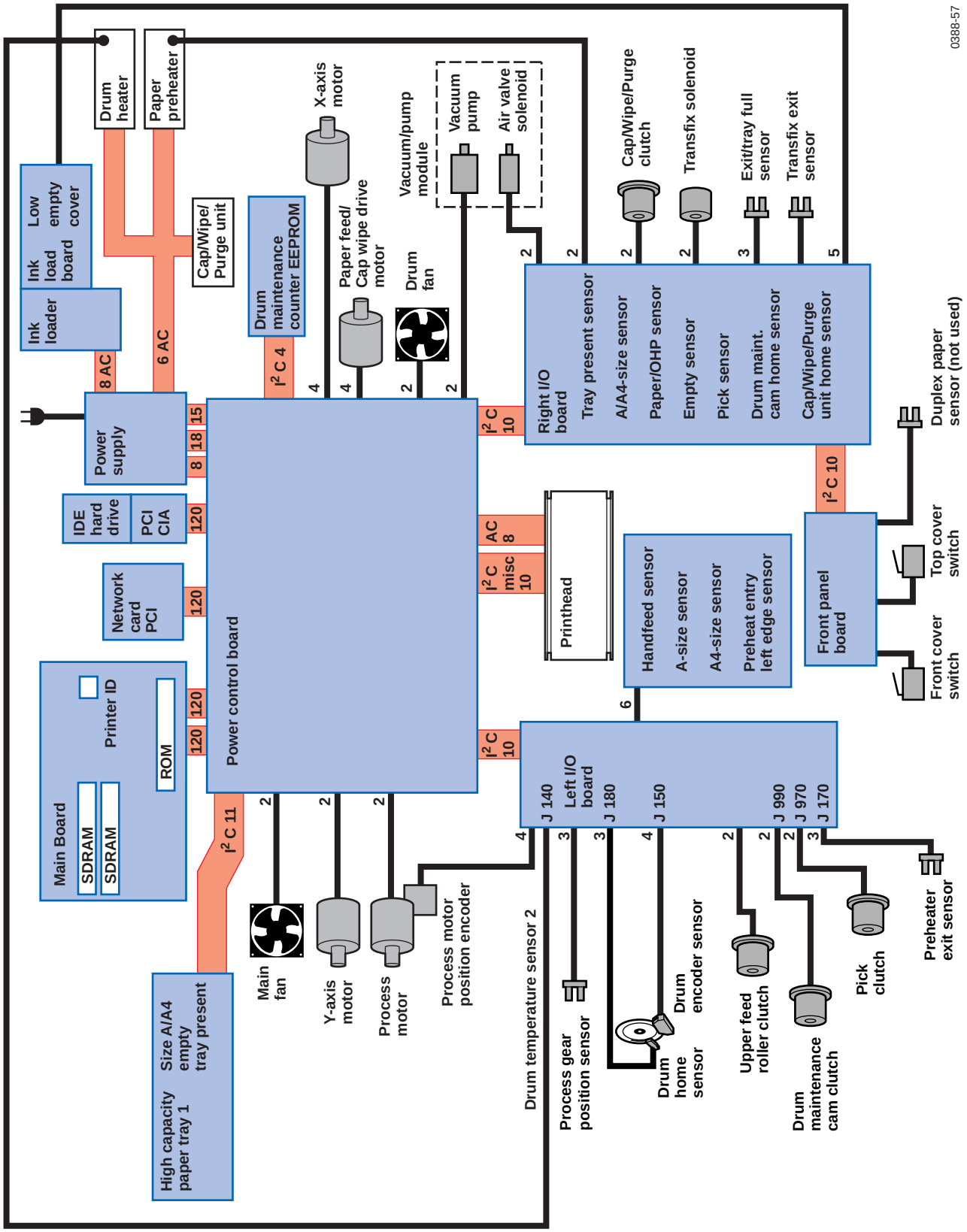


Figure 1-14. Printer Functional Block Diagram

Drum/Transfix Assembly

The drum/transfix assembly (Figure 1-15) forms the key portion of the printer where imaging takes place. The main features of the drum/transfix assembly (Figure 1-16) are the drum and transfix roller. In operation, the image to be printed on paper is first “printed” on the rapidly rotating drum. A sheet of paper heated by the paper preheater is then passed between the drum (now rotating much more slowly) and the transfix roller. Under the pressure between the drum and the transfix roller, the image is transferred to the sheet of paper.

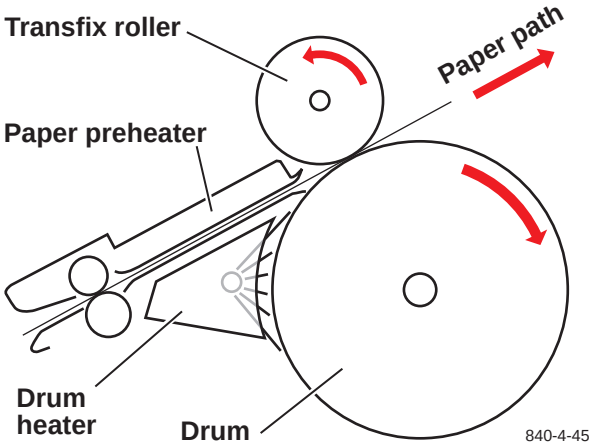


Figure 1-15. The Drum And Its Systems

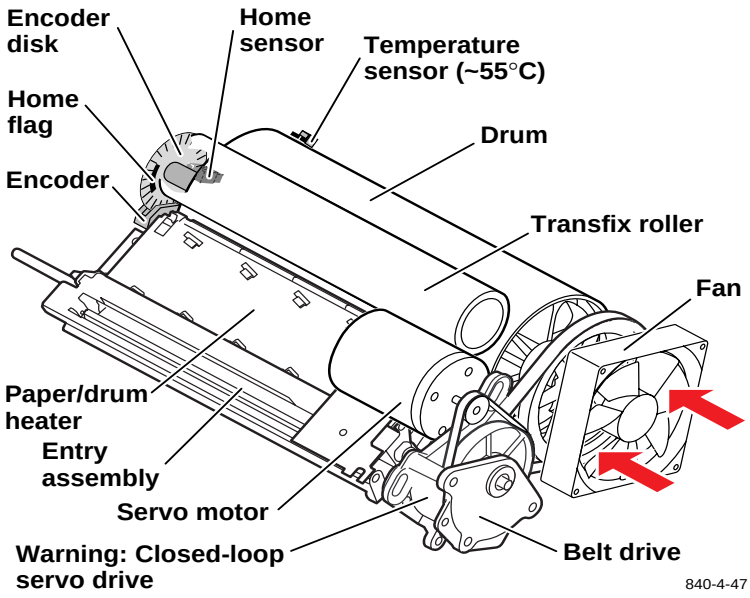


Figure 1-16. Drum/Transfix Assembly

An encoder disk and sensor on the left end of the drum monitors the drum's speed as well as its "home" position. The drum heater heats the surface of the drum to about 55° C (131° F) for imaging. A temperature sensor in contact with the drum surface monitors the drum temperature. The main board interprets the sensor's signal and turns on the drum heater and drum fan to heat the drum, or turns on the drum fan alone to cool the drum.

The drum is driven by a closed-loop servo motor which, through a double reduction belt drive, rotates the drum at a high speed for imaging and a constant low speed for image transfer to paper.

WARNING

Keep your fingers away from the drum drive system; it uses a closed-loop drive system. A closed-loop servo drive system is inherently dangerous. Since the motor speeds up if it senses the drum drive system slowing down, fingers caught in the drum belts and gears can be severely injured.

Maintenance Drawer

The maintenance drawer performs two functions. Its primary function is to create a thin intermediate liquid transfer surface, a layer of silicone oil, on the surface of the drum prior to printing. The oil keeps the ink from sticking to the drum's surface and facilitates its transfer to the sheet of paper. The oil is contained in an oil saturated roller. The drum maintenance drawer's second function is to collect waste ink from printhead purges in a waste tray. Refer to Figure 1-17.

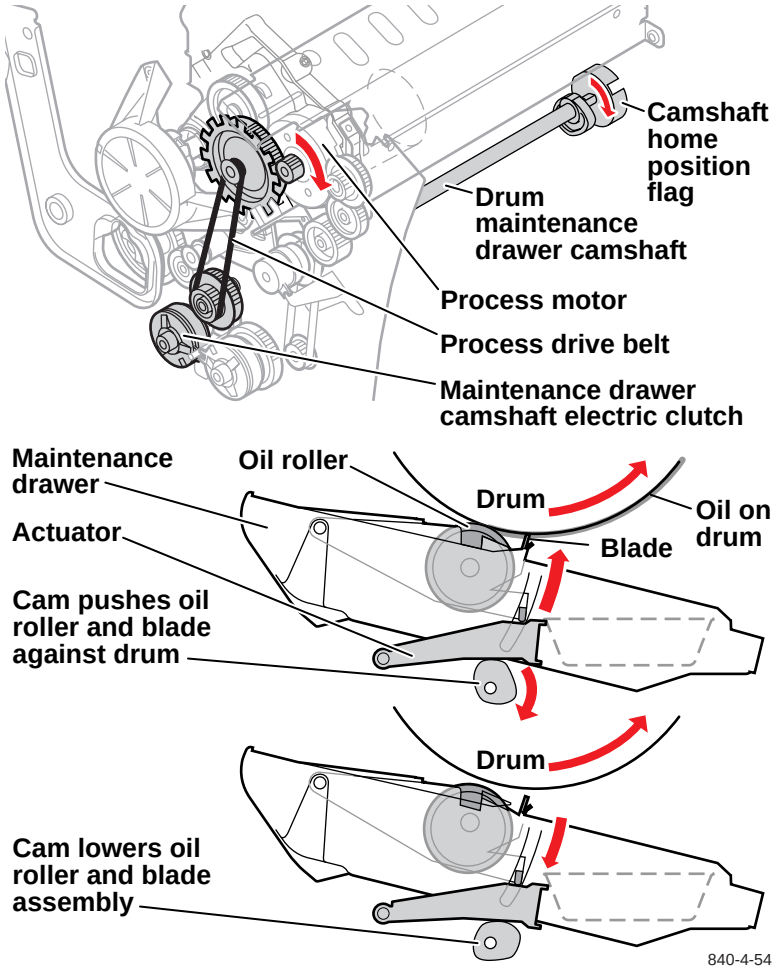


Figure 1-17. Drum Maintenance Drawer

Prior to each print, a cam, driven by the process motor, raises the oil roller against the slowly rotating drum. A compliant blade, also raised by the same cam, assures that the oil film is smooth and even across the drum's surface. The blade also directs excess oil back through a

felt filter to the oil roller for reuse. As the drum completes one rotation, the rotating cam lowers the oil roller and then a moment later, lowers the blade.

A removable NVRAM chip, mounted on the drawer, stores the number of oiling cycles performed by the maintenance drawer.

Printhead

The printhead (Figure 1-18) is the heart of the printer. Refer to Figure 1-17. The printhead spans nearly the length of the drum. Using its 448 ink-jet nozzles (112 jets for each density), with a horizontal motion of slightly more than 5 mm (0.2 inches), the printhead can print the entire image on the rotating drum.

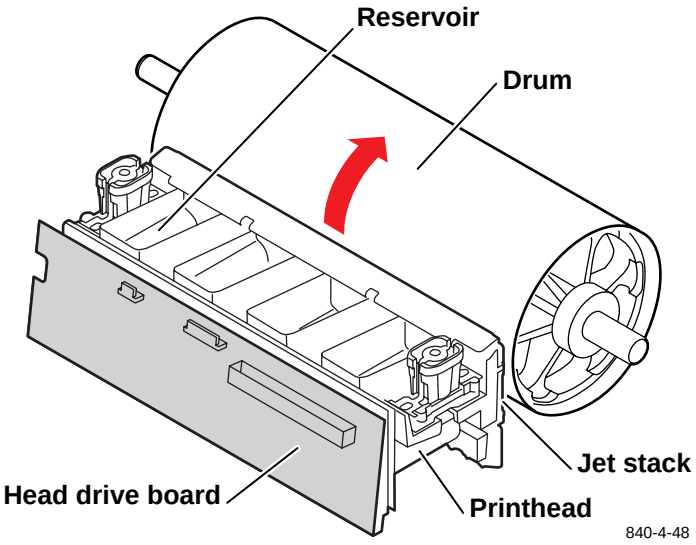


Figure 1-18. Printhead

Figure 1-19 shows a cross-section of the inkjet array and the jet nozzle arrangement.

The printhead's jet stack is fabricated from a stack of chemically etched steel plates which are brazed together to form the ink-jet array. Channels formed by the stacked plates route ink past the 448 individual, piezoelectric crystal-driven diaphragms, which force the ink in droplets out the 448 corresponding nozzles. Looking at the printhead face, the nozzles are arranged in four rows with the intermediate density nozzles forming the top row, the low density nozzles forming the next row 22 /300" below, and the clear nozzles forming the third row 11/300" below and the high density nozzles forming the fourth row 22/33" below. During the printing process, the printhead would only have to travel 22 pixels horizontally to provide complete coverage. (In actuality, the printhead travels much further to interlace with the output of neighboring jets.)

The Drift Compensation setting in the hidden Service Support menu enables automatic drift compensation. When it is turned on, it slowly increases the printhead drive voltage over time to maintain optimal printhead performance.

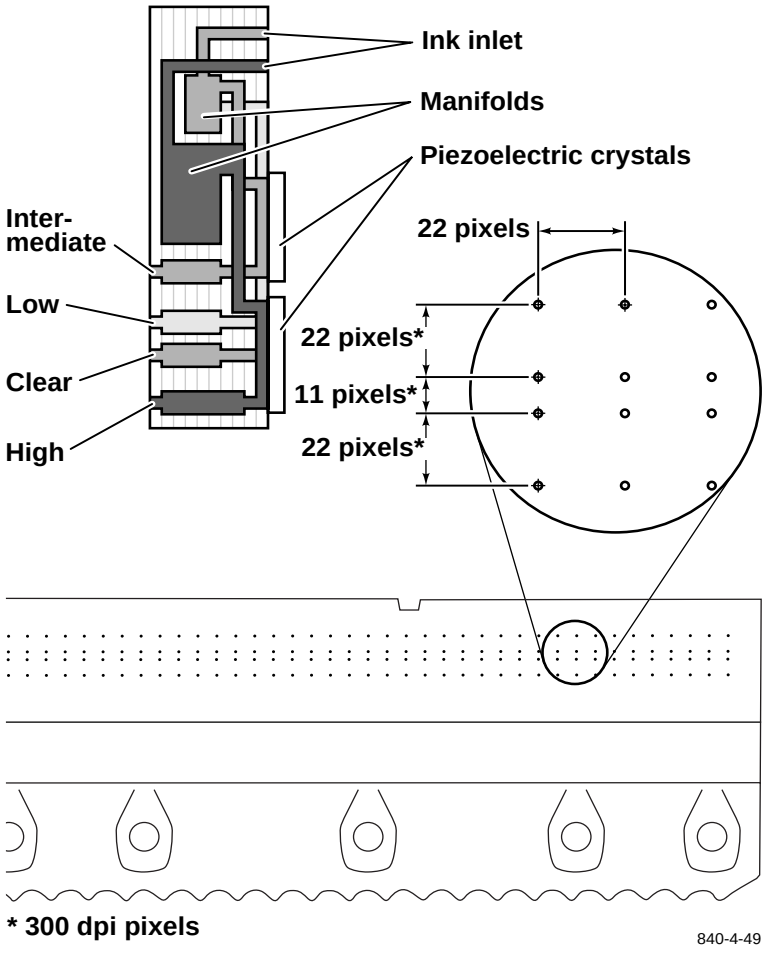


Figure 1-19. Printhead Detail

The ink-jet array is bonded to a cast aluminum ink reservoir. The reservoir supplies the molten ink to the ink-jet array. Heaters in the reservoir and the ink-jet array maintain the ink at a temperature of about 140° C for printing. The level of the ink in the reservoir is kept at a constant level.

X-axis Movement

X-axis or lateral movement of the printhead is accomplished using a stepper motor driving a fine-thread leadscrew. The printhead, mounted to the X-axis shaft, moves right and left across the surface of the drum.

To find the printhead home position, the X-axis system drives the printhead in an open loop. The printhead is driven against the left printer frame for a few seconds, and then reversed a set number of steps.

A spring attached to the printhead and right printer frame, provides a preloaded tension so the printhead moves smoothly.

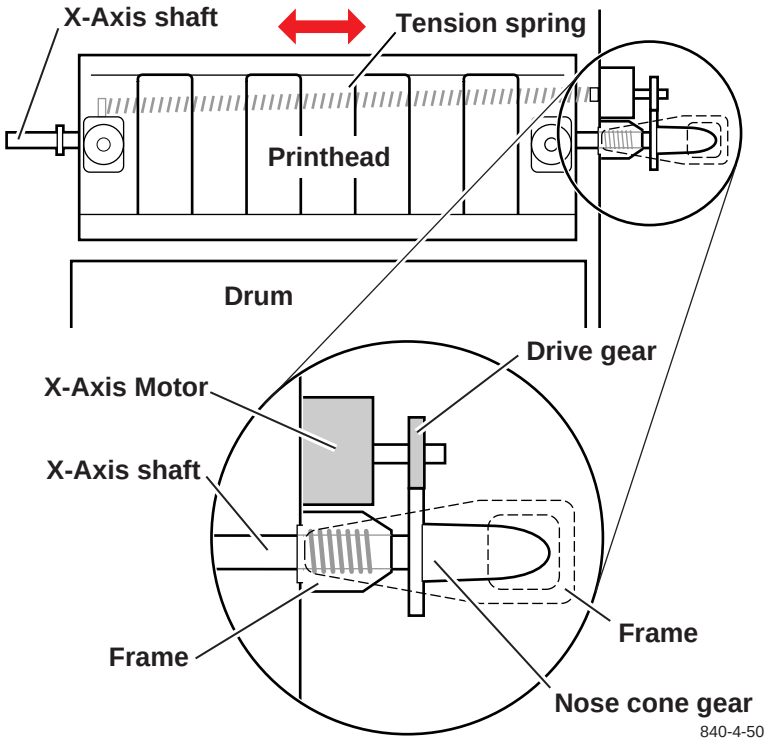


Figure 1-20. X-axis Printhead Movement During Printing

Printhead Tilting Mechanism

To accommodate printhead maintenance, the printhead can be tilted back away from the drum. (Refer to Figures 1-21 and 1-22.) This creates room for the cap/wipe/purge assembly to be moved into position in front of the printhead faceplate. The printhead tilts back on its X-axis shaft that it travels on. The X-axis shaft is connected to the head tilt arm. At the lower end of the arm is a cam-follower. The cam follower (and tilt arm) respond to the movement of the head tilt cam gear. As the gear rotates, the arm follows the motion and tilts back the printhead.

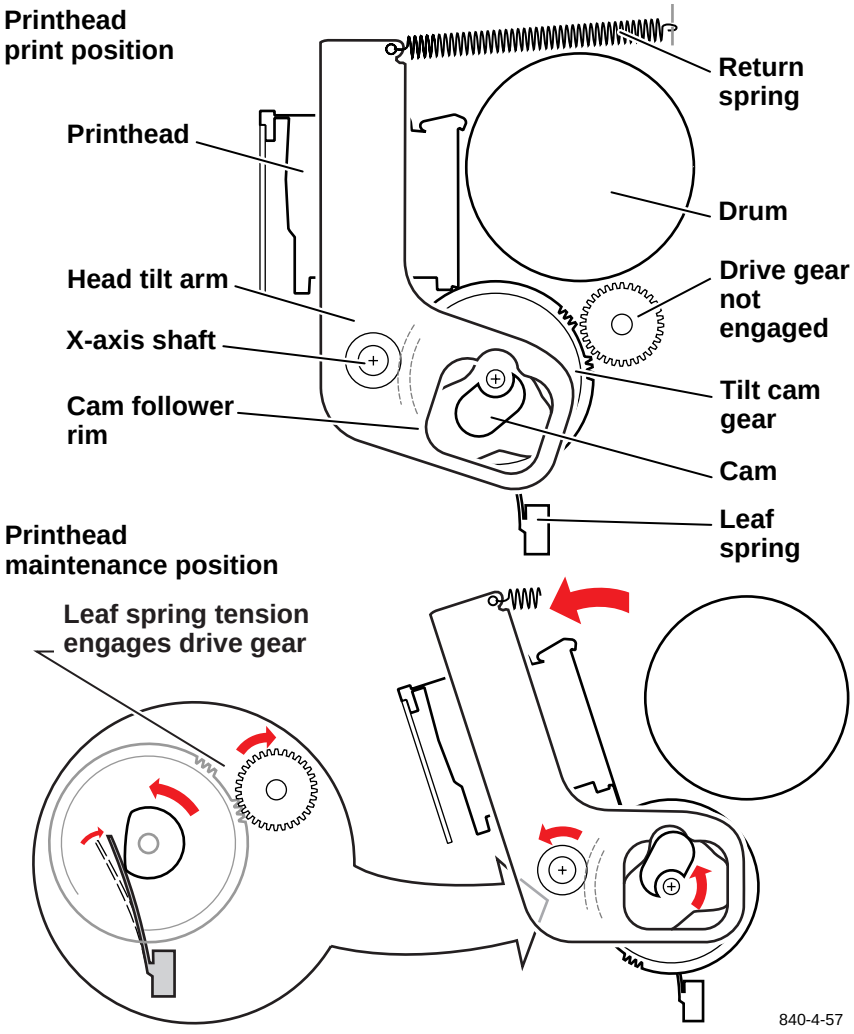


Figure 1-21. Printhead Tilting Operation

A return spring at the top of the tilt arm pulls the printhead toward the drum.

In the print position, the tilt arm gear's missing teeth are positioned at the tilt arm gear's drive gear. When actuated, a leaf spring pushes against a cam lobe on the backside of the tilt cam gear to give the tilt cam gear a slight rotation and engage its teeth to the drive gear. The leaf spring is held away from the cam lobe of the tilt cam gear by the cap/wipe/purge assembly in its standby position. Slightly raising the cap/ wipe/purge assembly releases the leaf spring and allows it to push the cam lobe and rotate the tilt arm gear slightly.

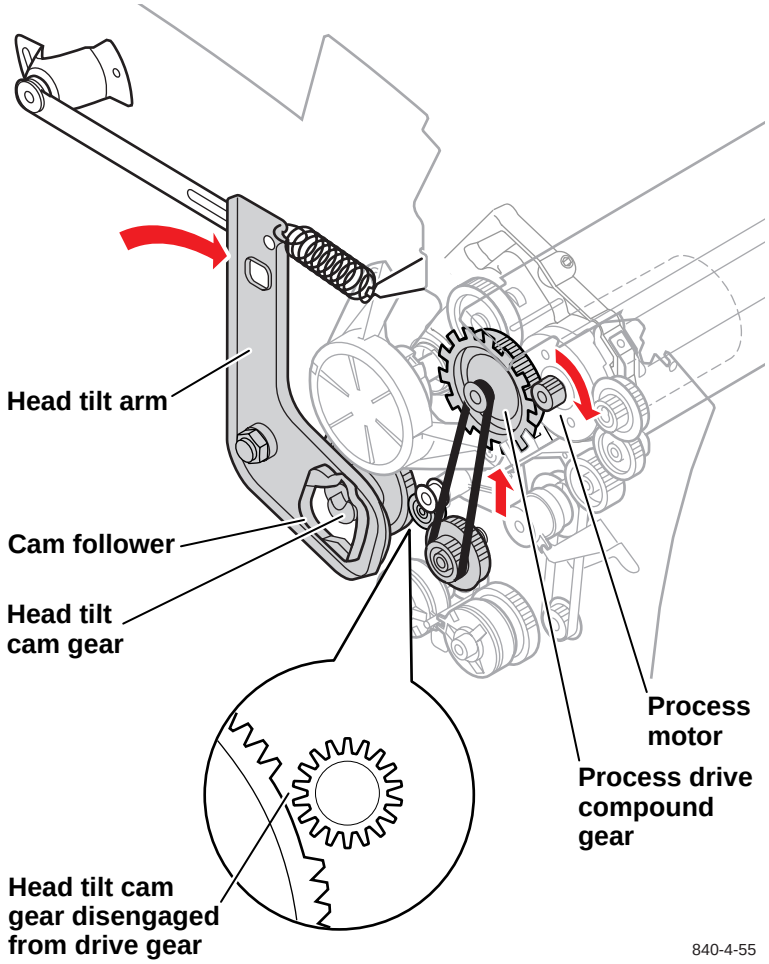


Figure 1-22. Printhead Tilting Mechanism

Ink Loader

The ink loader consists of four parallel channels with an ink melting element at the end of each of the four channels. (Refer to Figure 1-23.) Ink sticks, one color loaded in each channel, are pressed by coil-spring pressure into the melting elements. As ink is required by the printhead, the appropriate color's melting element is activated and the end of the ink stick is melted. The melted ink drips into the ink reservoirs of the printhead underneath. Sensors in the ink loader alert the customer to install more ink sticks before the current sticks are completely consumed.

If the ink level sensors inside the printhead detect that the printhead has run out of ink, but the ink low/out sensors are not activated, the front panel reports an "Ink Jam" error.

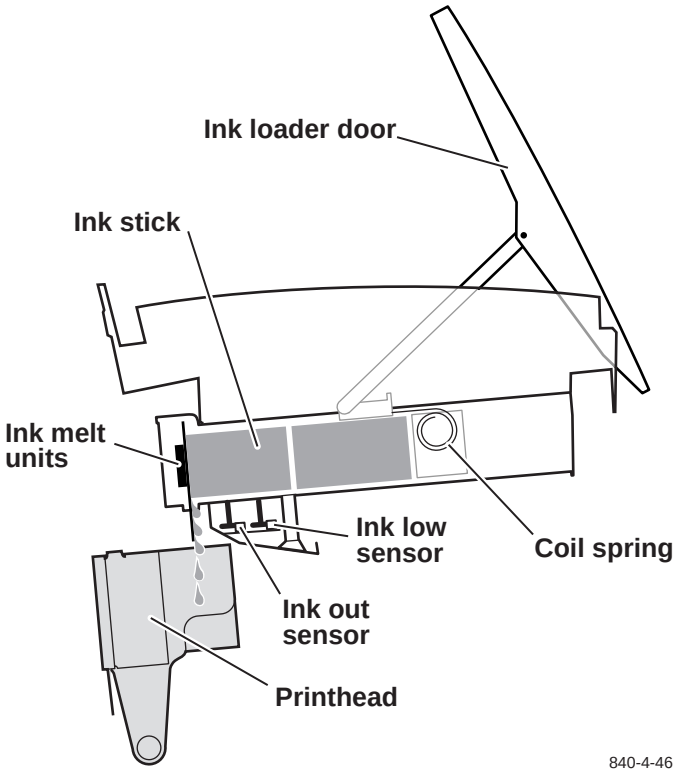


Figure 1-23. Ink Loader

Cap/Wipe/Purge Assembly

The cap/wipe/purge assembly is a long, shallow cup with an elastomeric gasket. (Refer to Figure 1-24.) When raised and pressed against the face of the printhead, it forms an airtight seal. After forming the seal, a partial vacuum is applied to the faceplate to suck out air bubbles and any debris that may be obstructing the printhead nozzles. Following the vacuum cycle, the cap/wipe/ purge assembly performs a wipe operation on the faceplate using its squeegee-like wiper blade. The cap/wipe/purge assembly also receives the ink ejected from the printhead during the flush portion of the printhead maintenance cycle. The flushed ink is routed to the waste tray of the drum maintenance drawer. The cap/wipe/purge assembly is heated to keep the waste ink fluid during the wipe and purge operations.

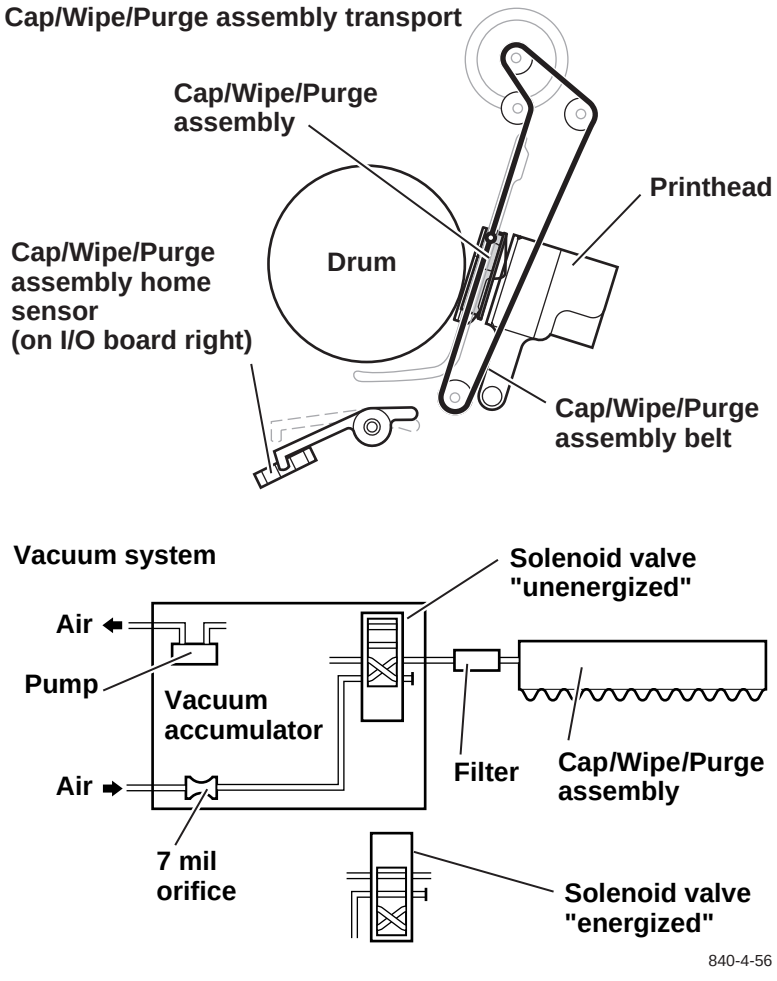


Figure 1-24. Cap/Wipe/Purge Assembly

The cap/wipe/purge assembly is attached to a pair of parallel belts on a rotating shaft. To perform a printhead maintenance cycle, the printhead is first tilted away from the drum. Then the cap/wipe/purge assembly motor drives the cap/wipe/purge assembly belts, which pull the attached cap/wipe/ purge assembly up to the faceplate of the printhead. The printhead is then tilted forward to seal against the cap/wipe/purge assembly.

When the cap/wipe/purge assembly is in its lowered home position, it unlocks the maintenance drawer so it can be removed. If the cap/ wipe/purge assembly is away from its home position the drum maintenance drawer is locked in place.

WARNING

When servicing the printer be careful of the cap/wipe/purge assembly as it passes the printhead. If a damaged wiper blade of the cap/wipe/purge assembly catches on the printhead it could propel hot liquid ink upward into your face.

Vacuum for the purge cycle is obtained from the vacuum/pump module which contains a vacuum pump and an air valve solenoid (Figure 1-25). The body of the vacuum/pump module forms a vacuum accumulator. A small vacuum pump, running for 75 to 90 seconds, creates a strong vacuum in the vacuum accumulator. Then an air valve is energized for a fraction of a second, exposing the printhead faceplate to the strong, accumulated vacuum to suck debris and bubbles out of the printhead nozzles. With the air valve once again de-energized, air is metered through the 7-mil orifice to gradually release the vacuum at the faceplate.

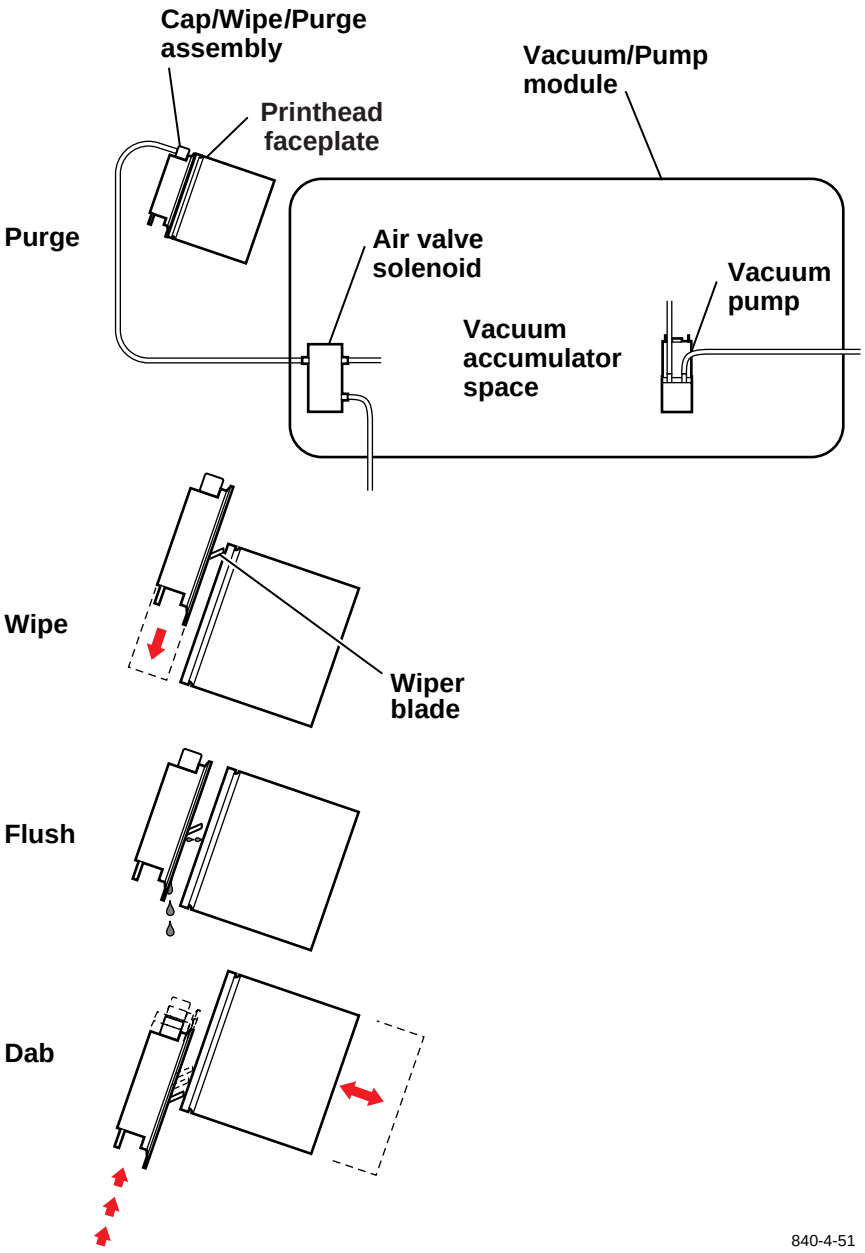


Figure 1-245 Cap/Wipe/Purge Assembly and Vacuum System

Power Supply

The power supply has two main, yet interrelated sections: the AC section and the DC section. In the AC section, power is routed to 14 opto-isolated triacs which, under main board logic control, supply AC power to the 14 heaters in the printer.

Two fuses provide current protection to the triacs. Fuse F2 and F3 protect the power supply from, most often, a shorted triac caused by a defective heater. If F2 or F3 fuse blows, it is best to replace the power supply (and, of course, the defective heater), rather than the fuse. Otherwise, with the fuse replaced, but the triac shorted, AC power may be applied to the heater without the printer even being turned on. Each time the main board turns on a triac to activate a heater, it is turned on for only a fraction of a second. The main board must constantly readdress each heater it wants to remain on. By this means, if the print engine firmware should fail, the heaters automatically shut off. The printer is also protected by thermal fuses located inside: two fuses for the drum heater, and one each for the paper preheater and the cap/wipe/purge assembly. A thermal fuse opens in the unlikely event of a "runaway" heater following a firmware failure.

The DC power supply generates +5 volts for the printer's logic, + 40 volts for the motors, +54 volts and -52 volts for the printhead drivers, and ±12 volts for fans. Fuse F1 provides protection for the switching power supply in the DC section. The block diagram for the power supply is illustrated in Figure 1-26.

WARNING

Do not touch the power supply; AC line voltages are present. The power-switch does not interrupt AC power to the power supply, it only signals the supply and the printer logic to begin a shutdown sequence. Even with the power switch in the OFF position, AC line voltages are present on the power supply, heaters and heater wiring.

There are no field adjustments necessary on the power supply.

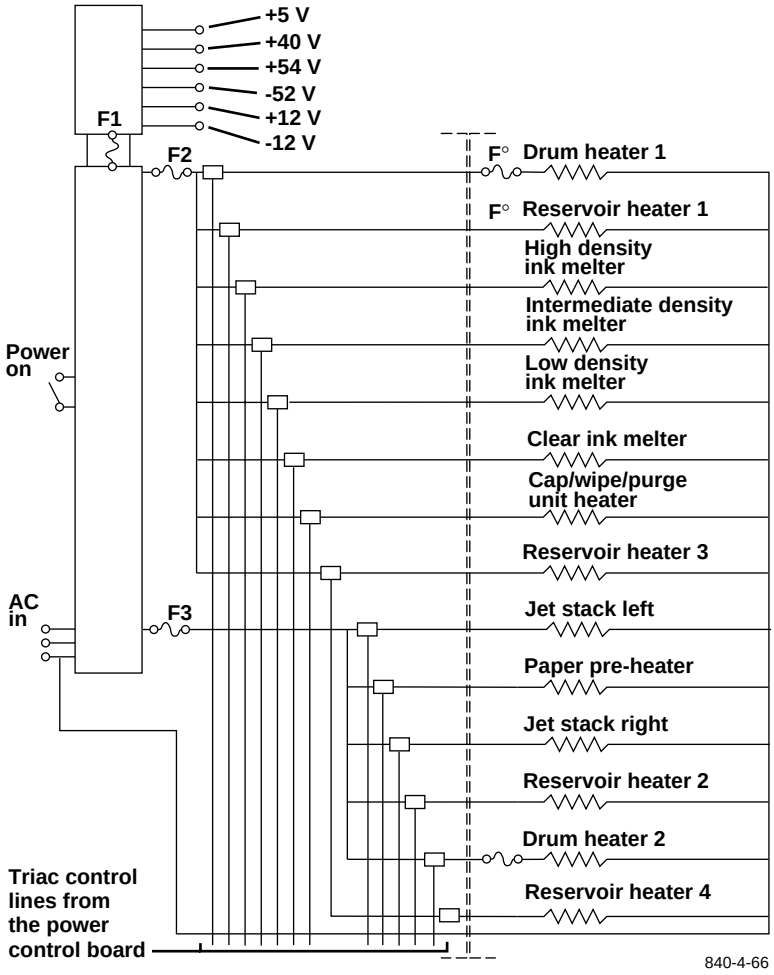


Figure 1-26. Power Supply Block Diagram

Print Process in Operation

Once an image has been processed and a printing bitmap created, a print cycle begins. The printhead and drum are brought up to their operating temperatures and the ink levels in the ink reservoirs are checked and ink is added from the ink loader, if necessary. Next, the printhead is driven horizontally to its home position and the drum is rotated to its home position.

WARNING

Keep your fingers away from the process gear drive system; it uses a closed-loop drive system. A closed-loop servo drive system is inherently dangerous. Since the motor speeds up if it senses the process gears drive system slowing down, fingers caught in the process belts and gears can be severely injured.

Printhead Tilt

The printhead is tilted forward into its print position. (Refer to Figure 1-27.) The process motor is activated, which drives the process drive belt. The belt, in turn, drives a compound gear. Through a follower gear, the compound gear drives the head tilt cam gear clockwise. A cam follower, mounted on the lower end of the head tilt arm, follows the rotating cam gear, which tilts the printhead. The head tilt cam gear rotates until a set of missing teeth in the cam gear “disengage” it from the cam drive gear. The cap/wipe/purge assembly, in its standby position, draws a leaf spring away from a cam lobe located at the back side of the tilt arm gear. (When the leaf spring pushes against the cam lobe of the tilt arm gear it forces the gear to mesh with the cam drive gear.) Pulling the leaf spring away effectively latches the head tilt cam gear in the printhead forward position. At this point, the printhead is in its upright print position (home position). (The head tilt cam gear is principally rotated in a counterclockwise direction to tilt the printhead forward and back. It only rotates clockwise during some printhead cleaning operations.)

Tilted forward, the missing teeth of the head tilt cam gear allow the process motor and gear train to perform other print functions without affecting the printhead’s tilt position. The cap/wipe/purge assembly is raised slightly to allow the head tilt cam gear (with a slight spring assist from the leaf spring pushing against the cam lobe on the back of the tilt cam gear) to advance forward enough to engage its drive gear and tilt the printhead back.

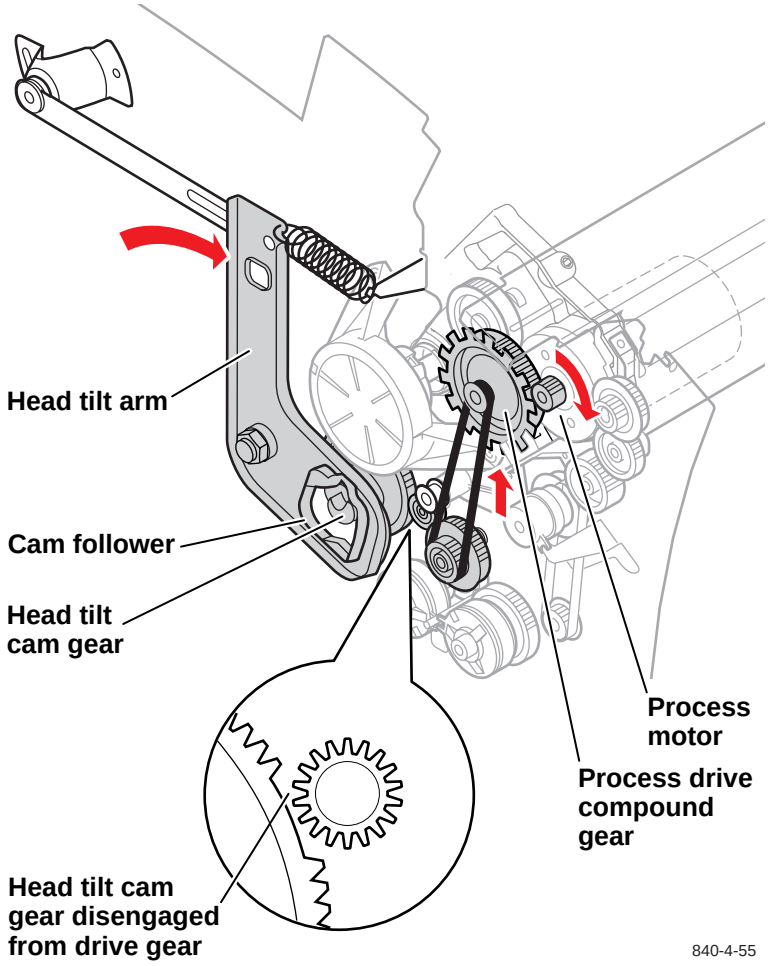


Figure 1-27. Tilting The Printhead

Drum Preparation

To prepare the drum, a thin, intermediate liquid transfer surface is applied to the surface of the drum. (Refer to Figure 1-28.) First the drum is rotated to a speed of 51 cm per second (20 inches per second). Next, the oil roller and blade of the maintenance drawer are raised into contact with the drum. To accomplish this, the process motor rotates clockwise, driving the process drive belt and the compound gear. Rotating clockwise, the compound gear drives a gear train that drives the maintenance camshaft's 3-position electric clutch which, in turn, engages the maintenance drawer camshaft. The maintenance drawer camshaft clutch energizes to release the 3-position clutch, allowing it and the camshaft to rotate about one-half revolution to the next stop. The cams on the ends of the camshaft push against followers on each side of the maintenance drawer, forcing the oil roller and blade against the drum. The de-energized clutch holds the camshaft in this position.

As the drum nears the end of its rotation, the clutch energizes for a moment, allowing the camshaft to rotate further; this lowers the oil roller but leaves the blade in contact with the drum to smooth out the last of the oil on the drum.

The clutch energizes for a third time to allow the camshaft to rotate to its home position, and lower the blade. The point at which the blade ends contact with the drum leaves a bead of oil, called an oil bar. The oil bar defines the edge of a 40 mm (1.5 in.) swath of the drum which is not oiled; this swath is called the deadband. No ink will be deposited on the deadband during the print cycle. Instead, the paper stripper fingers, which lift the paper off of the drum during printing, are lowered into contact with the drum in the deadband. This keeps them from accumulating any oil on their fingertips which would stain the edge of the print as it is stripped off of the drum.

At this point, the drum starts rotating again at a speed dependent upon print resolution. As the drum reaches the correct speed, the ink-jets begin to fire to deposit the image on the oiled portion of the drum. As the jets fire, the printhead slews in the X-axis to complete the image on the drum.

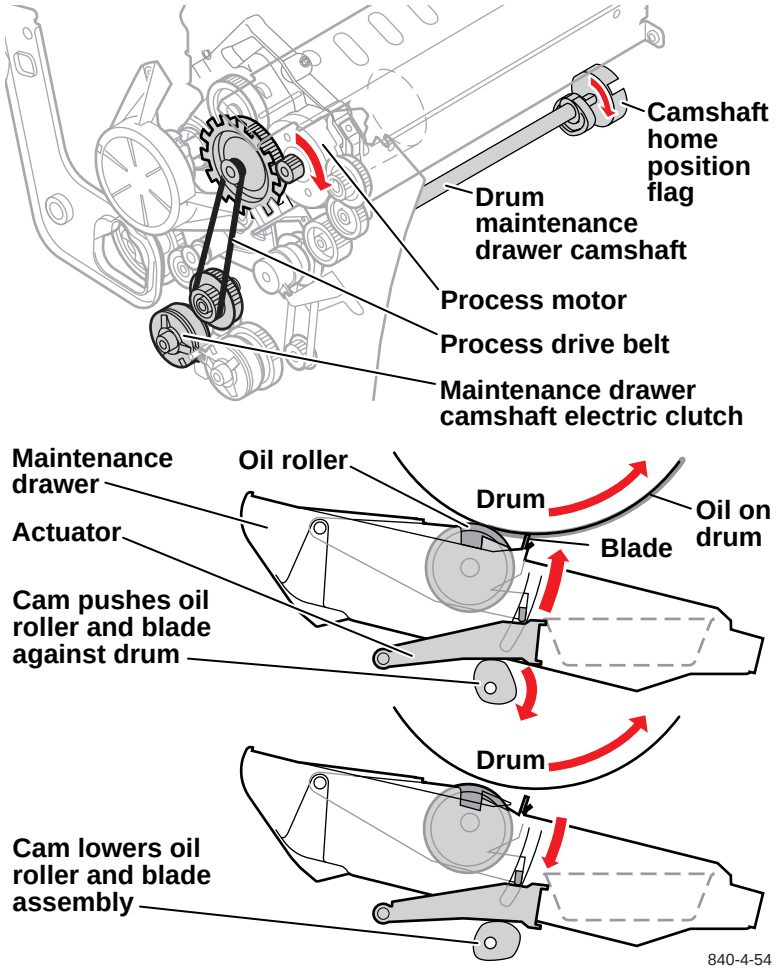


Figure 1-28. Drum Preparation For Printing

Printing

When printing, the printer performs a “four-jet interlace” in which each jet lays down a particular number of pixel columns depending on the print resolution. Each jet lays down one pixel column for each drum rotation; this varies from 30 to 44 rotations (30 @ 409 dpi and 44 @ 600 dpi). Each jet travels horizontally the distance of 125 to 181 pixels (125 @ 409 dpi and 183 @ 600 dpi) to lay down its 30 to 44 pixel columns within that pixel field. The 125 to 181 pixel-wide field of each jet overlaps the pixel field of six other jets; this is where interlacing occurs.

During the horizontal movement of the printhead, extra 1 or 2-step movements are made to properly align the pixel columns and prevent a column from overlapping another column. The actual number of steps depends on the print resolution.

Physically, each jet is horizontally located 22/300 of an inch from its neighbor.

Interlacing “averages out” the variability between jets by interlacing each jet with three other jets. As shown in the Figure 1-28, of the pixel columns printed by any single jet, only two of its pixel columns are actually ever adjacent. Usually they are separated by three other pixel columns produced by other jets, hence the name *four-jet interlace*. Because of the physical spacing between jets and the pixel field that each jet travels, the pixel columns of any one jet actually interlaces with the pixel columns of six other jets, although no more than four at any one time.

During some diagnostic printing, such as the Cleaning Test Print, the printhead slews to the right and lays down 112 parallel bands of ink. Each band is about 1.86 mm (0.073 inch) wide and is composed of 30 pixel columns of dots from an individual jet. As the printhead slews to the right, the drum rotates 30 times; the number of pixel columns each set of jets deposits on the drum. (A set of jets is one of the 112 vertical arrangements of low density, medium density, clear and high density jets.) With no interlacing, the test print reveals the deficiencies of a single jet compared to the rest. Only in the Test Print 2: Weak/Missing Jets (I-mode) and the Print Jets Test Page test print, does the printhead simply slew sideways with no jet interlacing.

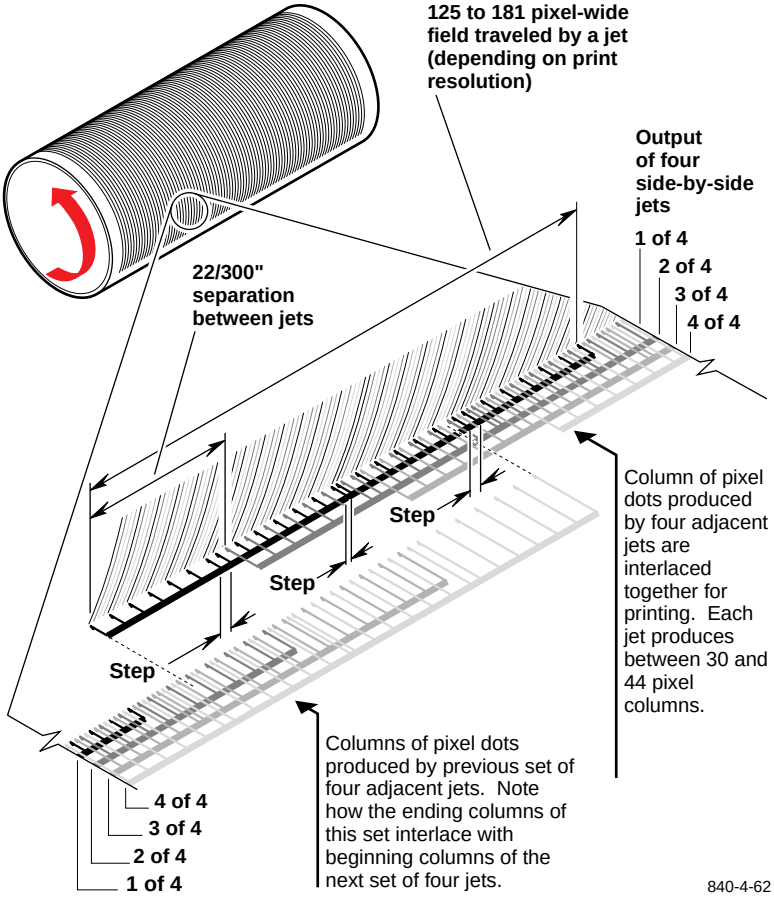

125 to 181 pixel-wide field traveled by a jet (depending on print resolution)
Output of four side-by-side jets
1 of 4
2 of 4
3 of 4
4 of 4
22/300" separation between jets
Step
Step
Step
Column of pixel dots produced by four adjacent jets are interlaced together for printing. Each jet produces between 30 and 44 pixel columns.
Columns of pixel dots produced by previous set of four adjacent jets. Note how the ending columns of this set interlace with beginning columns of the next set of four jets.
4 of 4
3 of 4
2 of 4
1 of 4
840-4-62

Figure 1-29. Printing Latent (Pre-transferred) Image On The Drum

Paper Pick

To pick a sheet of paper, the process motor rotates clockwise, driving the process drive belt and the compound gear counterclockwise. (Refer to Figure 1-30.) Rotating counterclockwise, the compound gear turns and, in turn, engages a gear train that rotates the pick roller clutch gear counterclockwise. The paper pick electric clutch energizes for a moment, engaging the paper pick clutch and allowing it to rotate one revolution. The pick roller rotates and pulls a sheet of paper from the paper tray. The sheet of paper trips the paper pick sensor to assure that the paper was picked from the tray. If the paper is not sensed, the pick solenoid is energized, up to six times, to rotate the pick roller again to attempt to recover from the mis-pick and pick the sheet of paper.

With the paper-pick sensed, the paper-feed motor drives the upper and lower paper-feed rollers and carries the sheet of paper to the paper preheater. On its way, the sheet of paper passes the deskew fingers which are flexible, plastic fingers mounted on the front cover. The deskew fingers guide the paper and create a buckle in the paper which aligns the paper to the paper path.

The paper stops at the entry to the paper preheater, tripping the paper preheater entry sensor on the left end of the paper preheater. The paper also trips the paper width (A/A4-size) sensors on the right end of the paper preheater to verify that the width of the paper is within the printer's specifications. At this point, the paper feed motor is stopped to wait for more ink deposition on the drum.

When ink deposition is about 95% complete, the paper feed motor is activated to bring the sheet of paper through the paper preheater and to the transfix position. The paper preheater heats the paper to improve ink transfer. The leading edge of the sheet of paper trips the paper preheater exit sensor as it passes out of the paper preheater.

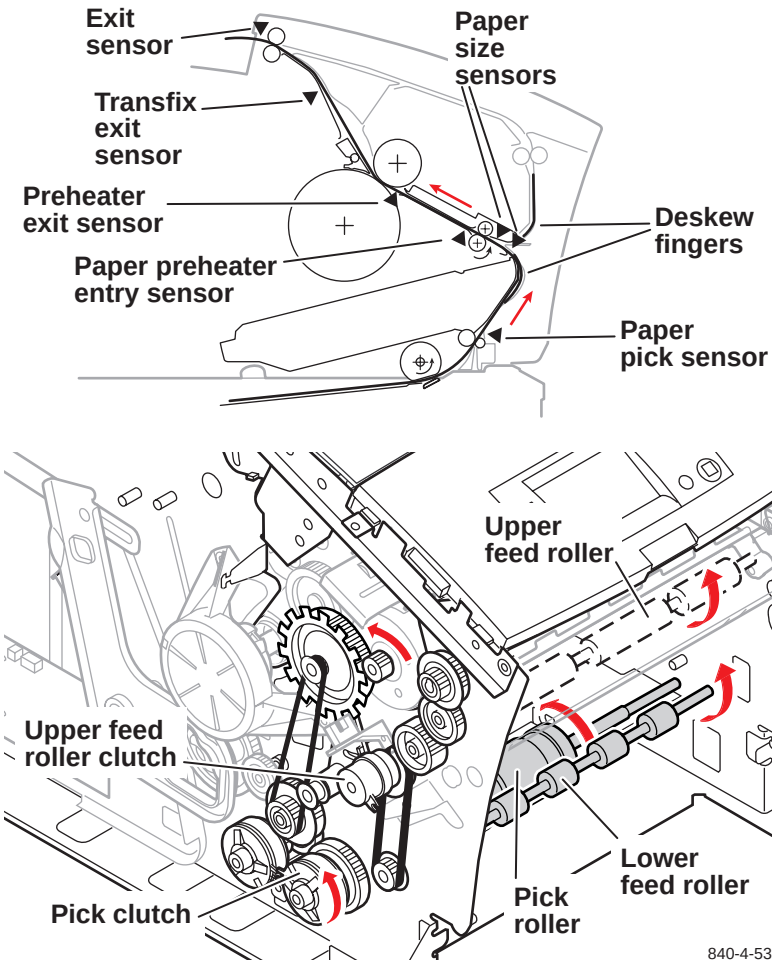


Figure 1-30. Paper picking and positioning for transfixing

Transfixing, Stripping And Exiting

As the leading edge of the sheet of paper trips the paper preheater exit sensor, it starts the transfix roller being lowered to its transfix position. The process motor rotates clockwise, rotating the process drive compound gear counterclockwise. Fourteen flags on the circumference of the gear represent the fourteen teeth on the small gear on the back of the compound gear. When the teeth of the small gear are in the proper position, as detected by the compound gear position sensor, the transfix cam solenoid energizes to release the spring-loaded transfix cam on the right end of the transfix roller shaft. This allows the transfix roller gear (which up to this point in time had missing teeth “disengaged” to the 14-tooth gear of the process drive compound gear), to rotate slightly and engage the small gear of the compound gear. During this time, the drum, rotating at about 24 rpm, positions the deadband to coincide with the arrival of the leading edge of the sheet of paper (which is moving at the same rate as the drum).

The rotating transfix gear rotates the transfix roller shaft about one-half revolution. The transfix roller, which is eccentrically mounted on the transfix roller shaft, rotates into contact with the paper (5 mm behind the leading edge) and then stops. This sandwiches the leading edge of the paper between the transfix roller and the beginning of the image on the drum. The drum’s rotation rotates the transfix roller and begins to pull the sheet of paper between them. The transfix roller shaft rotates slightly more so a protrusion on the transfix roller cam causes the stripper fingers to momentarily drop down onto the deadband of the drum and catch the leading edge of the sheet of paper and direct the paper to the rotating exit rollers, which are belt driven by the paper path motor. The transfix roller shaft rotates slightly more to clear the protrusion on the transfix roller cam and raise the stripper fingers so they no longer contact the drum.

The process motor stops, leaving the transfix roller cam in its half-rotated position. Friction from the rotating drum continues to turn the transfix roller, which freely rotates on the transfix roller shaft. The ink on the drum transfers to the sheet of paper pulled by the friction between the drum and the transfix roller. After about 1.8 seconds, the complete image has been transferred to the paper. The process motor drives the transfix gear until the transfix gear is completely unloaded. At this point, the transfix gear is disengaged from the process motor gear, the transfix cam solenoid is latched again and the transfix roller is lifted off of the drum.

The paper path motor, driving the exit rollers through a drive belt, pushes the remainder of the sheet of paper into the exit tray. The trailing edge of the paper is detected by the exit sensor, ending the print cycle.

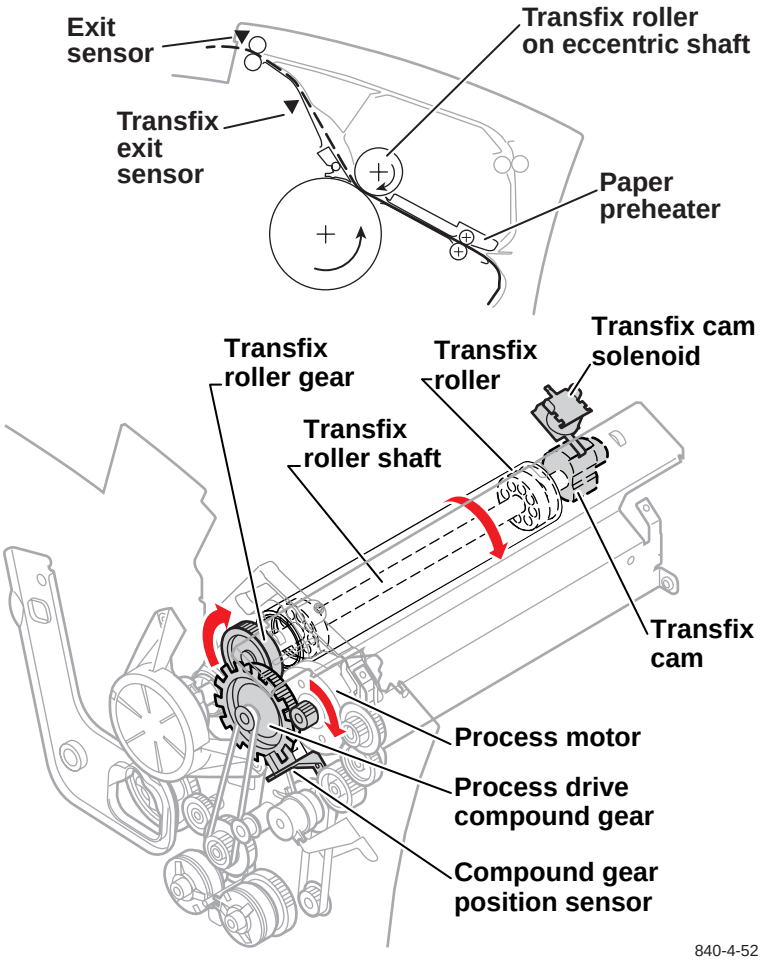


Figure 1-31. Image Transfixing, Stripping and Paper Exiting

Printer Self-Maintenance

To maintain peak operation, reliability and print quality, the printer has several automatic or semiautomatic maintenance functions. (Refer to Figure 1-32.) These functions may be started automatically after a certain number of prints or during printer startup, or they may be started by the customer if a print quality defect is noted.

- Printhead maintenance cycle
- Paper preheater cleaning
- Transfix roller oiling
- Drum cleaning (chase page)

Printhead Maintenance Cycle

This topic describes the cleaning cycles used to remove bubbles or foreign matter that cause a printhead jet to malfunction. Three basic actions take place during a cleaning cycle:

- purging
- wiping
- flushing

These actions are used in different combinations for three different types of cleaning cycles:

- quick wipe
- short cleaning
- long cleaning

The long cleaning cycle is performed automatically when the Clean Jets menu item is run a second time.

The long cleaning is described here. The short cleaning and the quick wipe are basically subsets of the long cleaning cycle.

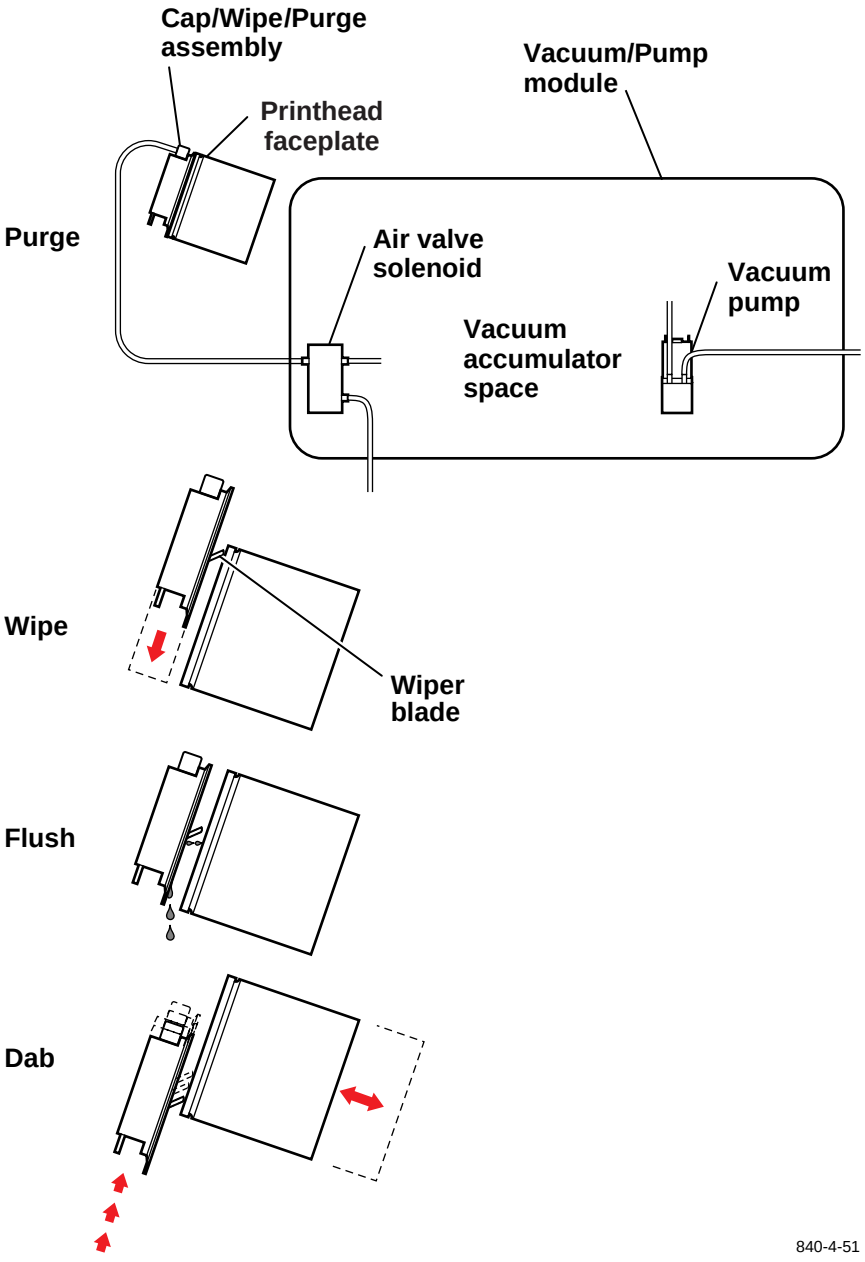


Figure 1-32. Printhead Maintenance Cycle

Preparation. Following printer power-up from a cold start or in response to a front panel menu selection, the print engine begins a printhead long cleaning cycle. The first step is to stop any ink melting operation. The printhead is tilted into the standby position. In this case, the cam follower follows the rotating cam gear, tilting the printhead backward. Following the head tilt, the cap/pipe/purge clutch energizes to engage the cap/wipe/purge timing belts to the paper path drive system. Then the paper path motor rotates counterclockwise to pull the cap/wipe/purge assembly into its cleaning position. Next, the printhead is tilted forward slightly to seal against the cap/wipe/purge assembly.The vacuum pump turns on for .5 seconds, just before sealing to build a slight vacuum in the accumulator. The solenoid valve opens as the cap seals on the printhead to prevent air from being pushed into the printhead. The cap then moves down a little bit to improve the seal. Then the main board starts the vacuum pump, which begins to create a vacuum in the vacuum accumulator. The pressure in the accumulator is lowered to about 10 psi. It takes the vacuum pump about 75 to 90 seconds to achieve this vacuum and then the pump is shut off.

Purge. Actual cleaning begins with the air valve solenoid energizing for 0.300 seconds; this momentarily routes the vacuum accumulator to the cap/wipe/purge assembly and exposes the printhead faceplate to the vacuum. The vacuum bleeds off after about 6 seconds through the 7 mil orifice. This is repeated 3 to 4 times, depending on the purge type, with 15 seconds between events. Then the printhead is tilted backward to break the seal and the printer waits 10 seconds for the waste ink to drain from the cap/wipe/purge assembly into the waste tray.

Long wipe. The paper path motor slowly rotates clockwise to pull the cap/wipe/purge assembly's wiper blade down the face of the printhead, wiping away ink and debris.

Long flush. The printhead is tilted back slightly and the cap/wipe/purge assembly is raised to bring the wiper blade even with the jet nozzles. All jets are fired for 6 seconds to flush mixed ink and foreign matter out of the jets. The waste ink drips into the waste tray of the drum maintenance drawer.

Dab. The cap/wipe/purge assembly is lowered slightly and the printhead is tilted forward to dab the wiper blade against the lower faceplate, to clean ink off the wiper. The dab is actually a short wipe and it is done on the part of the faceplate below the nozzles

Short wipe. Following the dab, the cap/wipe/purge assembly is raised and the printhead is tilted forward against the wiper blade. The cap/wipe/purge assembly is slowly lowered again to clean the faceplate but stops sooner, before it can run into the debris from the first wipe.

Short flush. The printhead is tilted back slightly and the cap/wipe/purge assembly is raised to bring the wiper blade even with the jet nozzles. All jets are fired again for 0.6 seconds.

Following the second flush, the printhead is tilted back and the cap/wipe/purge assembly is lowered into its standby position. A cap/wipe/purge home sensor on I/O board right detects when the cap/wipe/purge assembly is stored in its standby position. Then the printhead is tilted forward into its print position and a cleaning or “mud” page is printed. The cleaning page allows each jet to eject ink that may be slightly contaminated with another ink.

7 day flush. If no printhead clean cycle has been run for 7 days, the printer automatically performs a printhead flush to expel old ink from the printhead orifices. This gets rid of any old, “cooked” ink and improves printhead reliability.

Paper Preheater Cleaning

This is a customer-initiated cleaning procedure, selected through the front panel troubleshooting menu Remove Ink Smears. The purpose of this cleaning item is to clean ink out of the paper preheater that may have been deposited there. Ink can be deposited if a jammed print, with ink on it, was pulled backwards through the paper preheater. Heavier-weight, high-grade quality bond paper works best for this procedure.

In the paper preheater clean cycle, these events take place:

The user starts the Remove Ink Smears menu item.

1. The printer overheats the paper preheater to 100° C, softening ink trapped inside the paper preheater. Ordinarily the paper preheater runs at temperatures of between 60 and 65° C for paper printing.
2. The printer picks and passes up to 25 sheets of paper through the print path. Each sheet absorbs and removes ink from the paper preheater, but only the first five sheets are chased at the elevated temperature. Then up to 20 additional sheets are chased while the preheater cools down. The sheets are cleaning, but their main function is to bring the preheater temperature back down. The total number of chase sheets will vary from situation to situation. The printer can resume printing when the preheat temperature drops to 75˚C or below.
3. The printer returns to the Troubleshooting menu.

Because of the higher paper temperatures involved, this function can also be used to clean the drum surface of ink deposits caused by a contaminated blade on the drum maintenance drawer.

Transfix Roller Oiling

At the first opportunity after making 50 prints when no prints are queued and the printer is idle, the printer performs a transfix roller oiling cycle. During this cycle, oil is applied to the drum as it would be during a print cycle. Then the transfix roller is lowered against the drum and the drum rotates; this transfers some of the oil to the transfix roller, then the transfix roller is raised to its standby position. Oiling the transfix roller prevents ink and media from sticking to the transfix roller.

Drum Cleaning (Chase Page)

The printer performs a drum cleaning with a chase page automatically anytime a paper jam occurs after an image has been "printed" on the drum. The chase page transfers the image, which may not be complete, off the drum and is usually discarded. The printer then attempts to reprint the print that jammed. The chase page is processed the same as a regular print except the drum is not oiled and no image is printed on the drum (since an image is already printed on the drum).

Power Control Board

The power control board functions as a back plane. This circuit board is the point of electrical interface to the print head, main controller, optional Ethernet Interface card, internal hard disk drive, I/O boards. and power supply. The PCI bus signals supporting the optional Ethernet Interface card and internal disk drive are sourced from the image processing controller and are routed to the option slots on the power control board. Two optional PCI based boards: optional Ethernet Interface and Internal Disk Drive are available and plug into the power control board (back plane). Only one Ethernet interface is supported at a time. If an optional Ethernet Interface card is plugged into the printer, the printer's on-board 10 Base T Ethernet is disabled.

Main Board

The power control board contains all of the motor power drivers with actual control for the drivers located on the main controller. Switching for all heaters is contained in the power supply.

The main controller, or processing controller, uses a Motorola PowerPC 603e running at a nominal bus frequency of 32 MHz. The 603e PLL is configured for 4:1 operation resulting in a CPU frequency of 128 Mhz. DRAM is interfaced with a 64 bit bus and the PCI bus is 32 bits wide running at 33 MHz. Other interfaces in addition to PCI bus are parallel port, serial port, and USB device side port.
There are two dram (SDRAM) DIMM sockets on the board. These will accommodate industry standard 64 MB SDRAM modules up to a total of 128 MB.

There is one 168 pin DIMM socket for ROM/FLASH on the main controller. The interface to the controller is 64 bits.

Four DIP switches are located on the rear panel and from left to right are: Service Mode 3. Service Mode 2, Service Mode 1 and System Reset. The Three service Mode switches are defined by software and the System Reset is hardwired. After initialization both the PostScript and Engine LEDs blink to indicate normal operation. The Postscript and Engine LEDs are located to the left and right of the DIP switch respectively.

The Ethernet connector contains two integral LEDs. The yellow indicates **transmit** and green indicates **receive**.

The image processing controller contains an on-board Digital Semiconductor 21041-AB 10 Base T Ethernet port located at JR160. The controller's built-in Ethernet interface will support 10Mbit half-duplex Ethernet connections over category 3 (or higher) twisted pair cable and is automatically disabled when the optional 100 base T interface is installed.

Both the IEEE 1284 parallel port and the serial ports are

implemented using a Cirrus Logic CL-CD1284. The parallel port uses a 36 pin IEEE 1284 connector on the rear panel. The serial port provides RX and TX only with no handshaking. It is connected via a 5 pin square post 0.1" centers connector recessed into the rear panel. The CL-CD1284 general purpose 8-bit parallel 55º port is used for the following functions:

BIT #	FUNCTION	DESCRIPTION
0	Input	Service mode switch 1
1	Input	Service mode switch 2
2	Input	Service mode switch 3
3	Output	Reset control tor NETCHIP 2890
4	Input	Bit 1 of the 2 bit board version number
5	Input	Bit 2 of the 2 bit board version number
6	Input	Parallel Port master ready (host logic high)
7	Output	Parallel slave ready (peripheral logic high)

Optional Ethernet Interface Card (100 Base T)

The optional Ethernet Interface card has an RJ-45 connector, a 50-ohm BNC (coax) connector and four LEDs on the rear panel. The card includes a DEC 21143 Ethernet MAC, an ICS 1890 MII PHY and an 82C92 coax transceiver. There are no jumper or switch settings on the card. It supports 100Mbit connections over the RJ-45 connector using two pairs of category 5 cable at up to 100 meters (l00 Base-TX), or 10Mbit connections over the same connector using two pairs of category 3 (or greater) cable at up to 300 meters (10 Base-T). The card fully supports 802.3u clause 28 autonegotiation with parallel detection at 10 and 100 Mbits/sec on the RJ45 port. When connected to a hub switch port, the printer will determine the best possible speed and duplex setting, either 100Base-TX full-duplex, 100Base IX half-duplex, 10Base-T full-duplex or l0Base T half-duplex. If the RJ-45 port is not connected or the link to the hub/switch fails (e.g. due to a cable fault), the card will switch to 10Mbit/sec half-duplex operation over the coax (BNC) interface. Users should not connect cables to both ports; doing so will not disrupt the customer's network but may prevent the printer from communicating properly.

The operating mode of the interface may be determined from the Network Type parameter or by observation of the back-panel LEDs. There are four LEDs mounted in a square pattern. The upper two LEDs are yellow; the bottom two are green. The left-hand pair of LEDs indicate activity: the green LED will flash when the card is receiving data from the network and the yellow LED will flash when the card transmits data to the network. The right-hand pair of LEDs indicate the operating mode. The top right yellow LED will be on when the speed is 100Mbits. It is off for l0Mbits. The bottom right green LED will be on when the twisted-pair (11145) connector is in use and there is a good link to a hub. It will be off if the link fails or when the coax (BNC) connector is selected.

Optional Internal Disk Drive

The internal disk drive board contains a 3.2 Gigabyte IDE disk drive interfaced to the 32 bit PCI bus using a CMD Technology PCI646 PCI to IDE data conversion chip. Disk drive data transfer rates are 3.5 Mbytes/sec minimum and 5 Mbytes/sec maximum and are 16 bits wide.

Chapter

Chapter 2

Error Codes and Messages

This chapter provides a description of the error codes and messages.

Rear panel LEDs error codes 2-x

Rear Panel LEDs Error Codes

The rear panel LEDs are located on each side of the rear panel DIP switches.

NOTE: All references to right and left are as viewed from the reat of the printer.

The left LED represents the operation of the PostScript firmware. The right LED represents operation of the main board's print engine firmware. During the Power On Self Tests (POST), the two LEDs toggle back and forth for each successful pass through each SDRAM test. A failure in the power on self tests is indicated by the left LED (the PS LED) flashing in a specific pattern of long and/or short flashes and repeated indefinitely. A long flash represents a 5, while a short flash is a 1. For example, a long flash followed by 4 short flashes is 5 + 4 = 9. If the left LED repeatedly flashes in the same sequence, then the PostScript processor has encountered an error and is looping. The possible LED-encoded error codes are listed in Table 2-1. Other failures are indicated by the failure being printed on the Startup Page.

Table 2-1. Main Board Power-up Self-test Error Codes

Left LED Flashes Long flash=5 Short flash=1 2L+ 1S=11	**Meaning**	**Details**
1	not used	
2	SDRAM SIMM Presence	This test verifies for the presence of both SDRAM SIMMs. If both SDRAM SIMMs are missing, the resultant error indication is 2 short flashes from the left LED.
3	SDRAM Bank 0	This test verifies DRAM Bank 0 in the DRAM DIMM located in position 0 (closest to the rear panel.)
4	SDRAM Bank 1	This test verifies DRAM Bank 1 in the DRAM DIMM located in position 0 (closest to the rear panel.)
5	SDRAM Bank 2	This test verifies DRAM Bank 0 in the DRAM DIMM located in position 1 (farthest from the rear panel.)
6	SDRAM Bank 3	This test verifies DRAM Bank 1 in the DRAM DIMM located in Position 1 (farthest from the rear panel.)
7	not used	
8	not used	

Table 2-1. Main Board Power-up Self-test Error Codes (continued)

Left LED Flashes Long flash=5 Short flash=1 2L+ 1S=11	**Meaning**	**Details**
9	NVRAM	This test does a walking 1's and a walking 0's test for the last 4 bytes in the VXWorks section of the NVRAM.
10	EPROM	This test verifies in the first 24 bytes from the EPROM that verifies that the Tektronix Ethernet address 0x08, 0x00, and 0x11 has been copied into three locations.
11	Mariner ASIC	This test reads and verifies the version level of the Mariner ASIC.
12	Medusa ASIC	This test reads and verifies the version level of the Medusa ASIC.
13	Super Glue ASIC	This test reads and verifies the version level of the Super Glue ASIC.
14	CL1284 IC	This test reads and verifies the version level of the parallel port controller CL1284 chip.
none	SCSI	This test verifies the functionality of the SCSI I/O processor. Any test failures with this component are treated as non-fatal errors with the error information written to the Start Page. If a failure is detected, the message `SCSI Option Card` with one of the following messages will be sent to the Start Page: • `Wrong values in script-set registers.` • `Script operation timed-out.` • `Script operation returns wrong error code.` • `DMA transfer spills outside buffer.` • `DMA transfer data mismatch.`

Table 2-1. Main Board Power-up Self-test Error Codes (continued)

Left LED Flashes Long flash=5 Short flash=1 2L+ 1S=11	**Meaning**	**Details**
none	10BaseT	This test verifies the functionality of the Ethernet LAN Controller chip. Any test failures with this component are treated as non-fatal errors with the error information written to the Start Page. If a failure is detected, the message `Ethernet` with one of the following messages will be sent to the Start Page: • `General Failure` • `MAC internal loopback failure` • `MII internal loopback failure` (currently disabled)
none	Ethernet 100 BaseT Option card	This test verifies the functionality of the Ethernet LAN Controller chip. Any test failures with this component are treated as non-fatal errors with the error information written to the Start Page. If a failure is detected, the message `Ethernet Option Card` with one of the following messages will be sent to the Start Page: • `General Failure` • `MAC internal loopback failure` • `MII internal loopback failure`

Service Required Error Codes

Following are the Service required error codes that are displayed on the front panel.

2,000: SY I/O Board

Error Codes		
Front Panel Display	**Software Error Code**	**Meaning**
2,001.40	SY_DEV_FAULT_IO_RIGHT	The engine could not detect the presence of the I/O Right circuit board. Make sure all connections are made.
2,002.40	SY_DEV_FAULT_IO_LEFT	The engine could not detect the presence of the I/O Left circuit board. Make sure all connections are made.

4,000: PC Processor Control Supervisor

Error Codes		
Front Panel Display	**Software Error Code**	**Meaning**
4,001.40 (0x2401)	PC_DEV_FAULT_HEAD_READ pc fault: printhead NVRAM error	Failure reading Head NVRAM data: check wiring to head, I^2C bus and other hardware.
4,002.41 (0x2402)	PC_DEV_FAULT_HEAD_ZEROS pc fault: printhead NVRAM zeroes	Head NVRAM data was all zeroes: has this head been through normalization? If so, check wiring to head, etc.
4,003.42 (0x2403)	PC_DEV_FAULT_HEAD_ONES pc fault: printhead NVRAM ones	Head NVRAM data was all ones: has this head been through normalization? If so, check wiring to head, etc.
4,004.43 (0x2404)	PC_DEV_FAULT_HEAD_CHECKSUM pc fault: printhead NVRAM checksum	Head NVRAM checksum failure: the data within the head NVRAM has been corrupted. Check the hardware. The head may need to be renormalized.
4,005.44 (0x2405)	PC_DEV_FAULT_DM_CAM_ERR pc fault: DM cam position	Failure positioning the drum maintenance cam during a PM cycle: Check the DM cam, solenoid, clutch, home sensor, and related hardware.

4,000: PC Processor Control Supervisor (continued)

Error Codes		
Front Panel Display	**Software Error Code**	**Meaning**
4,006.45 (0x2406)	PC-DEV_FAULT_300DPI_CAL pc fault: 300 dpi calib	Calibration Failure: Target Volt-Sec Area of 300 DPI could not be achieved. Check the hardware. The head may need to be renormalized.
4,007.46 (0x2407)	PC_DEV_FAULT_600DPI_CAL pc fault: 600 dpi calib	Calibration Failure: Target Volt-Sec Area of 600 DPI could not be achieved. Check the hardware. The head may need to be renormalized.
4,008.47 (0x2408)	PC_DEV_FAULT_STUCK_DMC pc fault: DM oil sense	Failure to advance the drum maintenance oiling mechanism. It has been in the new state for too long. Check the hardware.
4,009.48 (0x2409)	PC_DEV_FAULT_DM_CAM_BEGIN pc fault: DM cam start position	At the start of a drum maintenance cycle, when the DM cam position should have been at blade down/web down, the DM cam home sensor should have been TRUE and was instead FALSE. Check DM cam solenoid, clutch, home sensor, and related hardware.
4,010.40 (0x240a)	PC_DEV_FAULT_DM_CAM_BU_WU pc fault: DM cam blade up/web down	During the drum maintenance cycle, when the DM cam position should have been at blade up/web up, the DM cam home sensor should have been FALSE and was instead TRUE. Check DM cam solenoid, clutch, home sensor, and related hardware.
4,011.41 (0x240b)	PC_DEV_FAULT_DM_CAM_BU_WD pc fault: DM cam blade up/web down	During the drum maintenance cycle, when the DM cam position should have been at blade up/web down, the DM cam home sensor should have been FALSE and was instead TRUE. Check DM cam solenoid, clutch, home sensor, and related hardware
4,012.42 (0x240c)	PC_DEV_FAULT_DM_CAM_END pc fault: DM cam end position	At the end of a drum maintenance cycle, when the DM cam position should have been at blade down/web down, the DM cam home sensor should have been TRUE and was instead FALSE. Check DM cam solenoid, clutch, home sensor, and related hardware.
4,013.43 (0x240d)	PC_DEV_FAULT_GEAR_GRIND pc fault: PM disengage	During power-on initialization, the engine is unable to disengage the process motor. Prior to declaring this fault, the engine has attempted to move the process motor through enough revolutions to disengage the head tilt mechanism, but the motor stalled somewhere along the way. The X-axis was then displaced to the right 0.15 inches and the disengage was repeated, but the motor stalled again. This leads to this device fault. The head is unable to move on the tilt axis, perhaps because it is colliding with something (head restraint pin, cap, poorly installed ink loader, screwdriver, etc.).
4,014.44 (0x240e)	PC_DEV_FAULT_6x6DPI_CAL pc fault: 6x6 dpi calib	Calibration Failure: 600x600 DPI waveform could not be generated. Check the hardware. The head may need to be renormalized

4,000: PC Processor Control Supervisor (continued)

Error Codes		
Front Panel Display	**Software Error Code**	**Meaning**
4,015.45 (0x240f)	PC_DEV_FAULT_HEAD_ADJUST_TIMEOUT pc fault: head adjust timeout	Timeout during head adjust. A 20 minute timer elapsed before the exit head adjust command was executed. The only recovery possible is to cycle the power switch.
4,016.46 (0x2410)	PC_DEV_FAULT_HEAD_NV_FORMAT pc fault: printhead NVRAM format	This head's NVRAM contains a format of data not supported by this version of firmware. The head or firmware must be replaced.
4,017.47 (0x2411)	PC_DEV_FAULT_AMBIENT_TOOCOLD pc fault: tempt too cold	Ambient temperature is less than 10 degrees Centigrade. The printer cannot be warmed up under these circumstances.
4,018.48 (0x2412)	PC_DEV_FAULT_LATE_CLEAN_REQUEST pc fault: late clean request	Printhead temperature has dropped below the head-clean-needed threshold. This condition occurred after the warmup sequencer had determined a head clean operation was not needed.
4,020.41 (0x2414)	PC_DEV_FAULT_FTTR_HEADCAP pc fault: FTTR head cap contact	Declared when the printer is booted in FTTR mode and the head/cap contact flag is set in NVRAM. The printer cannot run in FTTR mode with head/cap contact because it would be unwise to separate the two when cold. Service requested that this be a device fault in order to bluntly alert the service person to the condition.
4,021.42 (0x2415)	PC_DEV_FAULT_FTTR_DIRTYDRUM pc fault: FTTR dirty drum	Declared when the printer is booted in FTTR mode and the drum is dirty. Reasoning that cleaning the drum when very cold could increase the chance of gluing media to the drum surface and creating an ugly mess around the stripper fingers. Service requested that this be a device fault in order to bluntly alert the service person to the condition.
4,022.43 (0x2416)	PC_DEV_FAULT_INK_OUT_DURING_FLUSH_TIMEOUT pc fault: ink out timeout	Timeout during head flush for ink yellowing. The printer ran out of ink and a ten minute timer elapsed before more ink was added. The only recovery possible is to cycle the power switch.

5,000: VA Drum Error Codes

Error Codes		
Front Panel Display	**Software Error Code**	**Meaning**
5,001.41 (0x2c01)	YA_HOME_FAIL ya fault: drum home sensor	Drum home sensor failure: the drum turned one full revolution without seeing the drum home sensor activate.
5,002.42 (0x2c02)	YA_ENCODER_FAIL ya fault: drum encoder	Drum motion failure: the drum stalled, possibly because the drum position sensor electronics have failed, or because the motor drive or drive belts have failed, or because something is physically blocking the motion of the drum.

6,000: XA X-axis Error Codes

Error Codes		
Front Panel Display	**Software Error Code**	**Meaning**
6,000.41 (0x3400)	XA_FAULT_MCURRENT xa fault: over/under current	X-axis motor over/under current. Indicates that motor coil(s) are open, or shorted, or the XA motor fuse has opened.
6,001.42 (0x3401)	XA_FAULT_NOHOME xa fault: home sensor	X-axis home position not found. Indicates that the XA home sensor has failed, or something has prevented the printhead motion during a home operation.
6,002.43 (0x3402)	XA_FAULT_NGHOME xa fault: unexpected home sensor	Unexpected X-axis home sensor activation. The sensor has failed, the motor control is moving the head in the wrong direction, or the user has engaged the head restraint mechanism.
6,003.44 (0x3403)	XA_FAULT_LOST xa fault: home calibration	A verify of the home calibration failed. After locating the home sensor transition, the DMC computed X-axis position varied from the home value by more than the acceptable tolerance.

7,000: Process Motor Error Codes

Error Codes		
Front Panel Display	**Software Error Code**	**Meaning**
7,002.4x (0x3c01)	PM_FAULT_PROCESS_MOTOR_STALL	The process motor stalled during operation. This has several possible causes, depending on what the PM was connected to at the time of operation.
7,003.4x (0x3c02)	PM_FAULT_COMPOUND_GEAR_SENSOR_BAD	No transitions are observed of the compound gear sensor when the compound gear should be turning. Perhaps the sensor is bad (it falls off easily), or the PM to compound gear linkage is broken.
7,004.4x (0x3c09)	PM_FAULT_DM_CAM_SENSOR_BAD	No transitions are observed of the drum maintenance cam sensor. The sensor may be bad or the DM cam may be jammed.

8,000: Cap Drive and Web Sensors Error Codes

Error Codes		
Front Panel Display	**Software Error Code**	**Meaning**
8,001.44 (0x4401)	CAP_FAULT_HOME_SENSOR cap fault: home sensor	An expected transition of the cap home sensor did not occur. The home sensor may be faulty, or the cap motor may not be operating, or the cap may be jammed and unable to move.
8,002.45 (0x4403)	CAP_FAULT_OVERCURRENT cap fault: overcurrent	An overcurrent fault has been detected. Either the cap motor is shorted, the purge pump motor is shorted, a solenoid is shorted, or the cap stalled. (This fault does not actually occur because the mechanism is loose. When the cap jams, the motor skips over teeth.) Check the hardware.

9,000: Ink Loader: Ink Melters and Printhead Ink Level Sensors Error Codes

Error Codes		
Front Panel Display	**Software Error Code**	**Meaning**
9,005.40 (0x4c05)	IL_FAULT_LOW_JAM il fault: low density ink-stick jam	The low density ink melt heater is on, but Ink 12 does not seem to be dripping. Check that the stick of Ink 12 is able to advance in the chute.
9,006.41 (0x4c06)	IL_FAULT_INTER_JAM il fault: intermediate density ink stick jam	The intermediate density ink melt heater is on, but Ink 13 does not seem to be dripping. Check that the stick of Ink 13 is able to advance in the chute.
9,007.42 (0x4c07)	IL_FAULT_CLEAR_JAM il fault: clear ink stick jam	The clear ink melt heater is on, but Ink 11 does not seem to be dripping. Check that the stick of Ink 11 is able to advance in the chute.
9,008.43 (0x4c08)	IL_FAULT_HIGH_JAM il fault: high density ink stick jam	The high density ink melt heater is on, but Ink 14 does not seem to be dripping. Check that the stick of Ink 14 is able to advance in the chute.

13,000: Head Thermals Error Codes

Error Codes		
Front Panel Display	**Software Error Code**	**Meaning**
13,001.40 (0x6c01)	TCH_JS_LEFT_OPEN tch fault: left jetstack open	The thermistor in the left jetstack appears to be open.
13,002.41 (0x6c02)	TCH_JS_LEFT_SHORT tech fault: left jetstack shorted	The thermistor in the left jetstack appears to be shorted.
13,003.42 (0x6c03)	TCH_JS_LEFT_HOT tch fault: left jetstack run-away	The left jetstack heater is running away. Unplug the printer NOW!
13,004.54 (0x6d04)	TCH_JS_LEFT_SLOW tch fault: left jetstack not heating	The left jetstack heater is not heating at all, or is not heating as quickly as it should.
13,017.46 (0x6c11)	TCH_JS_RIGHT_OPEN tch fault: right jetstack open	The thermistor in the right jetstack appears to be open.
13,018.48 (0x6c12)	TCH_JS_RIGHT_SHORT tch fault: right jetstack shorted	The thermistor in the right jetstack appears to be shorted.
13,019.40 (0x6c13)	TCH_JS_RIGHT_HOT tch fault: right jetstack run-away	The right jetstack heater is running away. Unplug the printer NOW!

13,000: Head Thermals Error Codes (continued)

Error Codes		
Front Panel Display	**Software Error Code**	**Meaning**
13,020.52 (0x6d14)	TCH_JS_RIGHT_SLOW tch timer: right jetstack not heating	The right jetstack heater is not heating at all, or is not heating as quickly as it should.
13,033.45 (0x6c21)	TCH_RESERVOIR_OPEN tch fault: reservoir open	The thermistor in the reservoir appears to be open.
13,034.46 (0x6c22)	TCH_RESERVOIR_SHORT tch fault: reservoir shorted	The thermistor in the reservoir appears to be shorted.
13,035.47 (0x6c23)	TCH_RESERVOIR_HOT tch fault: reservoir run-away	The reservoir heater is running away. Unplug the printer NOW!
13,036.50 (0x6d24)	TCH_RESERVOIR_SLOW tch timer: reservoir not heating	The reservoir heater is not heating at all, or is not heating as quickly as it should.

14,000: Cap Thermals Error Codes

Error Codes		
Front Panel Display	**Software Error Code**	**Meaning**
14,001.41 (0x7401)	TCC_THERMISTOR_OPEN tcc fault: cap open	The cap thermistor appears to be open.
14,002.42 (0x7402)	TCC_THERMISTOR_SHORT tcc fault: cap shorted	The cap thermistor appears to be shorted.
14.003.43 (0x7403)	TCC_THERMISTOR_HOT tcc fault: cap run-away	The cap heater is running away. Unplug the printer NOW!
14,004.44 (0x7404)	TCC_THERMISTOR_SLOW tcc timer: cap heater not heating	The cap heater is not heating at all, or is not heating as quickly as it should.
14,005.45 (0x7405)	TCC_WRONG_TYPE_CAP tcc fault: cap incorrect	The installed cap heater is incorrect for this printer. Verify the correct cap heater is installed and/or the correct firmware is installed for this printer.

15,000: Drum Thermals Error Codes

Error Codes		
Front Panel Display	**Software Error Code**	**Meaning**
15,001.42 (0x7c01)	TCD_THERMISTOR_OPEN tcd fault: drum open	The drum thermistor appears to be open.
15,002.43 (0x7c02)	TCD_THERMISTOR_SHORT tcd fault: drum shorted	The drum thermistor appears to be shorted.
15,003.44 (0x7c03)	TCD_THERMISTOR_HOT tcd fault: drum run-away	The drum heater is running away. Unplug the printer NOW!
15,004.56 (0x7d04)	TCD_THERMISTOR_SLOW tcd timer: drum not heating	The drum heater is not heating at all, or is not heating as quickly as it should.
15,005.4x (0x7c05)	TCD_FAN_BLOCKED tcd fault: drum fan blocked	The drum fan heater is blocked, not operational or the heater is running away. Unplug the printer NOW!

16,000: Preheat Thermals Error Codes

Error Codes		
Front Panel Display	**Software Error Code**	**Meaning**
16,001.43 (0x8401)	TCP_THERMISTOR_OPEN tcp fault: preheat open	The preheater thermistor appears to be open.
16,002.44 (0x8402)	TCP_THERMISTOR_SHORT tcp fault: preheat shorted	The preheater thermistor appears to be shorted.
16,003.45 (0x8403)	TCP_THERMISTOR_HOT tcp fault: preheat run-away	The preheater heater is running away. Unplug the printer NOW!
16,004.46 (0x8404)	TCP_THERMISTOR_SLOW tcp timer: preheat not heating	The preheater heater is not heating at all, or is not heating as quickly as it should.

22,LSS,TC: Media Jams Error Codes

L indicates the location of the jam.		**SS** indicates sensor location.	
1	Bottom Hi-capacity Paper Feeder	00	Usually because of an opened door
2	Middle Hi-capacity Paper Feeder	01	Bottom High-Capacity tray sensors
3	Top standard tray	02	Bottom High-Capacity pick sensors
4	Handfeed	03	Middle High-Capacity tray sensors
5	Front cover	04	Middle High-Capacity pick sensors
6	Top cover	05	Standard tray sensors
7	Y-axis jams (see following error codes)	06	Standard tray pick sensors
9	Door opened jams (see following error codes)	07	Handfeed sensors
		08	Preheat entry sensor
		09	Width sensors
		10	Width A sensor
		11	Width A4 sensor
		12	Preheat exit sensor
		13	Stripper exit sensor
		14	Media Exit sensor
		15	<undefined>
		16	VE_DM CYCLE_DONE out of order
		17	VR_TF_ROLLER_LIFTED out of order
		18	Unknown reason
T indicates whether a timeout or an event occurred			
0	Event		
1	Timeout		
C indicates checksum			

22,000 Jam Error Codes

Error Codes		
Front Panel Display	**Software Error Code**	**Meaning**
22,703,0C	DECLARED JAM	Stall event
22,704,0C	DECLARED JAM	Sensor failure
22,705,0C	DECLARED JAM	Media jam at exit tray
22,707,0C	DECLARED JAM	Media too long at exit tray
22,708,0C	DECLARED JAM	Media too short at exit tray
22,721,0C	DECLARED JAM	Media not staged at preheater entry in time for transfix
22,722,0C	DECLARED JAM	Media jam at stripper fingers
22,901,0C	DOOR EVENT	The front access door is opened
22,902,0C	DOOR EVENT	The top, stripper, access door is opened

31,000 Media Preheater Error Codes

Error Codes		
Front Panel Display	**Software Error Code**	**Meaning**
31,003.4x	MP_FAULT_PREHEAT_EXIT_SENSOR_BAD	Declared at boot time when a check is made to determine the condition of the preheat exit sensor. Declared when the sensors around the preheat exit sensor indicate the presence or absence of media contrary to that indicated by the preheat exit sensor.

PostScript®-detected Error Codes

NOTE: Codes from 24,000 through 24,999 are engine failures reported by PostScript. They are NOT stored in the fault history table in NVRAM. These are reported when the engine has been stuck in a state for 25 minutes.

Error Code	Meaning
24,000.17	Engine reports power is off—impossible.
24,000.18	Engine reports it is running diagnostics—impossible.
24,002.10	Engine is stuck in the VxWorks shell.
24,003.11	Engine is stuck in mechanism init.
24,000.12	(unused)
24,005.13	Engine is in state ready but is not permitting commands.
24,006.14	Engine is stuck, in standby.
24,007.15	Engine is stuck, while printing.
24,007.16	Engine is stuck, while cleaning the drum.
24,009.17	Engine is stuck, while purging the head.
24,010.18	Engine is stuck, while wiping the head.
24,011.10	Engine is stuck, while oiling the roller.
24,012.11	(unused)
24,013.12	Engine has a fault but will not say why.
24,014.13	Engine is stuck while powering down.
24,015.14	(unused)
24,016.15	Engine is stuck while oiling the drum.

PostScript®-detected Error Codes (continued)

Error Code	Meaning
24,017.16	Engine is stuck while turning the pick rollers.
24,018.17	Engine is stuck while warming up—thermals will not stabilize.
24,019.18	Engine is stuck while warming up—thermals are stable.
24,020.10	Engine is stuck while warming up—it is too cold to warm up.
24,021.11	Engine is stuck while cooling down.
24,022.12	Engine is stuck while in the cool state. (Should never happen.)
24,023.13	Engine is stuck while in head adjust state.
24,024.14	Engine is stuck while flushing the head.

Winch-related Error Codes

Error Code	Meaning
26,001.44	Winch motor or sensors are not responding.

Front Panel Status Messages

The Front Panel status messages and solutions are shown in Table 2-2. The messages are listed in descending priority order.

Table 2-2. Front Panel Status Messages

Status Message	Solution
`Warming up—Please wait`	The printer is heating the ink; wait until `Ready to Print` is displayed.
`Ready to Print`	The printer is ready to accept print jobs.
`Ink low—Add ink`	Check ink levels; add appropriate ink sticks to the correct ink-loading bins.
`Maintenance Kit is low. Only XX Pages remaining before empty.`	Reorder a Maintenance Kit now. Replace Kit soon.
`Processing Data—Please wait`	The printer is processing data; wait until `Ready to Print` or Printing is displayed.
`Receiving data—Please wait`	The printer is receiving data; wait until `Ready to Print` or `Printing` is displayed.
`Printing—Please wait`	A print job is printing; wait until `Ready to Print` is displayed.
`Warming up—Please wait`	The printer is heating the ink; wait until `Ready to Print` is displayed.
`Warming up, Please wait. XX% complete`	The printer is heating the ink; warm up may take as long as 17 minutes; wait until `Ready to Print` is displayed.
`Initializing`	Initializing printer mechanisms—Please wait.
`Cleaning`	The printhead is being cleaned—Please wait.
`Canceling print job—Please wait.`	You have selected **Cancel**; wait while the job is removed from the queue.
`Canceling Cleaning—Please wait.`	The current cleaning operation has been canceled.

Table 2-2. Front Panel Status Messages (continued)

Status Message	Solution
`Standby mode—Press any button to return to Ready`	The printer is in an automatic power-saving mode. Press any button to return the printer to `Ready`. *NOTE: Pressing Help removes Standby—so you do not actually see this Help message.*
`Energy Star Mode active—Press any button to return to Ready`	Reduces power consumption.
`Head-To-Drum Adjust`	For Service use only.
`Upper media tray empty—Load paper`	The printer is stopped. Load paper into the upper media tray; insert in the printer.
`Lower paper tray empty—Load paper only`	The printer is stopped. Load paper into the lower paper tray; insert in the printer.
`Media tray empty—Load paper`	The printer is stopped. Load the paper into the tray; insert in the printer
`Replace lower paper tray`	The lower paper tray is missing. Printing can continue from the upper tray.
`Replace upper media tray`	The upper media tray is missing. Replace the tray to continue printing.
`Replace media tray`	The media tray is missing. Replace the tray to continue printing.
`Cleaning sheet needed—Load paper`	The printer was interrupted while printing a page. The printer requires a sheet of blank paper to remove the ink of the partially printed page before it can continue printing. Load paper in the paper tray.
`Cleaning sheet needed—Load letter-size paper`	The printer was interrupted while printing a page. The printer requires a sheet of blank letter-size paper to remove the ink of the partially printed page before it can continue printing. Load paper in the letter-size paper tray.
`Cleaning sheet needed—Load A4-size paper`	The printer was interrupted while printing a page. The printer requires a sheet of blank A4-size paper to remov ethe ink of the partially printed page before it can continue printing. Load paper inthe A4-size paper tray.

Table 2-2. Front Panel Status Messages (continued)

Status Message	Solution
`Close front cover to continue`	The printer is stopped; close the front cover to resume printing.
`Close exit cover to continue`	The printer is stopped; close the exit cover to resume printing.
`Close top cover to continue`	The printer is stopped; close the top cover to resume printing.
`Ink sticks jammed—Open and close top cover to clear jam`	Ink sticks under the top cover are not sliding properly. Open and close the top cover to resolve the problem. If the problem persists, jostle the ink sticks until there are no spaces between the sticks.
`Output tray full—Remove printed pages to continue`	The media in the output tray is either jammed or the tray is filled to capacity. Remove hte printed pages to continue.
`Out of ink—Open top cover. Add ink.`	The printer is stopped. Open the top cover. Add ink. Close the top cover.
`Add ink. Close top cover.`	The printer is stopped. Add ink. Close the top cover.
`Drawer A locked—Close front cover to continue`	Waste Tray B is cooling; Close the front cover and wait two minutes for Drawer A to be unlocked.
`Paused`	The printer is in pause mode. You may add media or ink safely. Press Resume to continue.
`Printing—Pause Pending this page completes.`	The printer is finishing the current page. It will pause when
`Media jam—Retry manual feed`	Remove media. Verify that media used is within specifications. Use both hands to reinsert sheet until it feeds and stops.
`Media jam—incorrect media size—Open exit cover to clear`	Remove jammed media and close the exit cover to resume printing.
`Media jam—Open front cover to clear`	Open the front cover and remove media to resume printing.
`Media jam—Remove media tray to clear`	Remove jammed media and reinsert media tray.

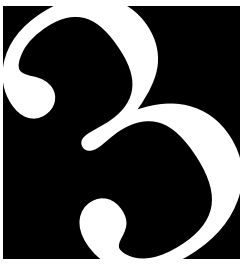
Table 2-2. Front Panel Status Messages (continued)

Status Message	Solution
`Media jam—Remove upper media tray to clear`	Remove jammed media and reinsert upper media tray.
`Media jam—Remove lower tray to clear`	Remove jammed media and reinsert lower media tray.
`Media jam—Remove Media to clear`	Remove jammed media to resume printing.
`Media jam—Open front cover to clear`	Remove jammed media and close the front cover to resume printing.
`Media jam—Open exit cover to clear`	Remove jammed media. Verify that the correct media is loaded and close the exit cover to resume printing.
`Incorrect media size—Load letter-size paper`	Printer needs letter-size paper to remove ink left from a failed print.
`Incorrect media size—Load A4-size paper`	Printer needs A4-size paper to remove ink left from a failed print.
`Drawer A locked—Close front cover to continue`	The printer is stopped; close the front cover to resume printing.
`Printer error—Contact service; report fault`	For the latest information, contact your local service provider.
`Lower paper tray empty—Load paper`	The printer is stopped. Load paper into lower paper tray; insert in printer.
`Caution! Hot surfaces—Remove Maintenance Drawer A. Caution!—Waste Tray B may be hot.`	The printer is stopped. Do not touch hot surfaces! Remove and reinsert Maintenance Drawer A.
`Caution! Hot surfaces—Replace the Maintenance Kit C1 and C2.`	The printer is stopped. Do not touch hot surfaces! Remove Maintenance Kit C1 and C2.

Table 2-2. Front Panel Status Messages (continued)

Status Message	Solution
`Caution! Hot Surfaces—Insert Maintenance Drawer A`	The printer is stopped. Do not touch hot surfaces! Reinsert Maintenance Drawer A.
`Maintenance Drawer A is missing. Open fron cover and insert Maintenance Drawer A.`	The printer is stopped. Open the front cover. Do not touch hot surfaces! Reinsert Maintenance Drawer A.
`Power Switch is Off Melting Ink Please Wait`	The power switch has been turned to the off position. But, the printer is currently melting ink.
`Power turned off—Wait 30 minutes before moving printer.`	The printer is shutting down; it will shut off momentarily.
`Waste Tray B full—Open front cover to empty`	The printer is stopped. Open the front cover. Empty and reinsert Waste Tray B. Close the front cover.
`Caution! Hot surfaces—Empty Waste Tray B.`	The printer is stopped. Do not touch hot surfaces! Empty and reinsert Waste Tray B. Close the front cover.
`Fast cool down mode—XX% Complete. Do not move printer until cool. Remove Maintenance Drawer A for shipping—See manual for details`	The printer is cooling the ink. Do not move the printer until the printer turns itself off.
`Standard shutdown (2 Minutes or less)`	The printer is shutting down.
`VxWorks Shell`	
`Manufacturing Mode`	For Service use only.

Chapter



Chapter 3

Troubleshooting

This chapter provides troubleshooting assistance as follows:

Verifying the Printer and Host Connections 3-3

System Power-up Sequence

The following lists the chain of events that occur when you turn on, reset or initialize the printer. You can follow this list as one means of determining if the printer is operating correctly. The exact chain of events depends upon where the printer "believes" the printhead is positioned. The printer records in NVRAM the last known position of the printhead and the cap/wipe/purge assembly.

Power switch turned on:

1. Low-level, power-on self-test (POST) diagnostics are performed. The two status LEDs at the rear panel should be blinking and the front panel LEDs are turned on.
2. If POST diagnostics pass, the front panel Error LED is turned off and the LCD display is cleared.
3. Depending upon the printhead position:

   Printhead in Standby or Print position

   a. If the printer is in its Standby mode, the cap/wipe/purge motor is run to ensure that the cap/wipe/purge assembly activates its home position sensor. If the printer is in Print mode, the printhead is moved to its x-axis home position and then centered.

   b. The process motor is rotated to tilt the printhead forward (if not already forward), rotate all the rollers to their ready positions, disengage the transfix roller, and lower the maintenance drawer blade and wiper.

   Printhead in Cap/wipe/purge position

   a. The heaters in the printhead and cap/wipe/purge assembly are activated to melt the ink "gluing" them together.

   b. The printhead is tilted back.

   c. The ink is allowed to drain from the cap/wipe/purge assembly.

   d. The cap/wipe/purge assembly is lowered to its home position.

   e. A short wipe is performed and the cap/wipe/purge assembly is returned to its home position.

   f. The process motor is rotated to tilt the printhead forward (if not already forward), rotate all the rollers to their ready positions, disengage the transfix roller and lower the maintenance drawer blade and wiper.

   g. The printhead is moved to its x-axis home position and then centered.

Printhead is in the print position but the cap/wipe/purge assembly is in some unknown intermediate position:

a. If the cap/wipe/purge assembly is not detected in its home position, then the heaters in the printhead and cap/wipe/purge assembly are activated in case the printhead and cap/wipe/purge may be “glued” together by cooled ink.

b. After waiting for the ink to melt, the cap/wipe/purge assembly is lowered to its home position.

c. The process motor is rotated to tilt the printhead forward (if not already forward), rotate all the rollers to their ready positions, disengage the transfix roller and lower the maintenance drawer blade and wiper.

d. The printhead is moved to its X-axis home position and then centered.

e. A short wipe is performed and the cap/wipe/purge assembly is returned to its home position.

4. The printhead is tilted back to the locked position.
5. The front panel displays a warm up message.
6. The heaters are enabled and the drum begins to rotate.
7. When the ink in the printhead is molten, the cap/wipe/purge assembly is positioned to the purge position.
8. The printhead tilts forward and a purge cycle begins.
9. A cleaning page is printed.
10. The front panel displays a message that the printer is initializing and then ready.

The print engine is initialized.

Verifying Main Board CPU Operation

1. If the printer does not power up (rear fan is off and power-up diagnostics LEDs are off), go to the topic, “Verifying power supply operation” below.
2. Observe the rear panel LEDs located on each side of the rear panel DIP switches. The left LED represents the operation of the PostScript firmware. The right LED represents operation of the main board's print engine firmware. During the POST tests the two LEDs toggle back and forth for each successful pass through each DRAM test. A failure in the power on self tests is indicated by the left LED (the PS led) flashing in a specific pattern of long and/or short flashes and repeated indefinitely. Other failures are indicated by the failure being printed on the Startup page.

After successful power-up, the left (PS) LED flashes in a “heartbeat” rhythm (on 0.5 seconds, off 0.5 seconds). The right (PE) LED pattern is two quick flashes on, then off for a count of two for a total cycle time of just over two seconds. The front panel Power light is turned on, the Error light is flashed, and the LCD is cleared.

Verifying Print Engine Operation By Printing Its Startup Page

1. If it is not already on, turn on the printer. If the printer does not begin initializing, go to the topic, “Verifying power supply operation” below.
2. Once the Power light is on (not blinking) and the front panel displays `Ready to Print`, scroll to **Menu** and press the **Select** button. Then scroll to the **Demo and Test Pages** menu item, press the **Select** button, and then scroll and select the **Print Startup Page** menu item. The printer should print out a Startup Page.

If the printer prints a Startup Page, then the print engine is working correctly. If the printer does not print a Startup Page, then a problem exists with the print engine.

Verifying Power Supply Operation

Required tools:

- TORX T-20 screwdriver
- Digital multimeter (DMM)

The power supply is divided into two sections: the AC section used for heaters and the DC section for control logic, printhead drivers and motors. Verifying the power supply involves three steps:

- Checking for proper AC voltage.
- Inspecting the power supply fuses.
- Testing for a shorted motor or solenoid driver, which shuts down the power supply.

Measuring Power Supply Voltages

WARNING

AC line voltages are present on the power supply and possibly in the printer, via the heaters, while the printer is plugged into an AC outlet, even if the power switch is off.

1. Turn off the printer and unplug it from its power outlet.
2. AC Input: With the DMM set to measure AC voltages, measure the power being supplied to the printer. It should measure between 87 to 128 VAC (115 VAC nominal) or 174 to 250 VAC (220 VAC nominal).
3. Proceed to the topic, “Inspecting the power supply fuses” below.

NOTE: If a heater shorts, F2 or F3 opens. The power supply does ***not*** *shut down, however, a Service Required error code is displayed on the front panel.*

Inspecting The Power Supply Fuses

Three fuses (F1, F2 and F3) are mounted on the power supply.

1. Turn off the printer and remove the power cord.
2. Remove the screws securing the power supply. Disconnect the wiring harnesses plugged into the power supply and remove power supply.

3. With a DMM, determine that the fuses on the power supply are functional. Fuse F1 is the AC input fuse for the DC section of the power supply. If F1 opens, the power supply does not function and should be replaced.

CAUTION

Fuse F2 and Fuse F3 are used for the AC heaters within the printer; they protect the power supply from, most often, a shorted triac. If F2 or F3 blows, it is best to replace the power supply rather than the fuse. Otherwise, with the fuse replaced, but the triac shorted, AC power may be applied to the heater without the printer being turned on, resulting in a thermal runaway condition.

If the fuses are functional, but the printer's power supply does not output DC voltages, proceed to the topic, "Testing for shorted drivers."

Testing for Shorted Drivers

1. Turn off the printer.
2. Disconnect the +40 DC loopback connector (the 4-pin connector with the two loopback wires) from J250 at the top of the power control board. (This isolates the Y-axis motor, process motor, X-axis motor, paper feed motor, vacuum pump, solenoids and clutches).
3. Attach the service load connector to J250 on the top of the power control board, behind the printhead, to simulate a load on the power supply. When viewed from the front of the printer, the lead with the ground clip should be to the right. See Figure 3-10 for correct orientation. Attach the service load connector's ground clip to the printer frame. Do not leave the service load connector in place and powered-up for longer than 5 minutes; it gets hot from the current load.

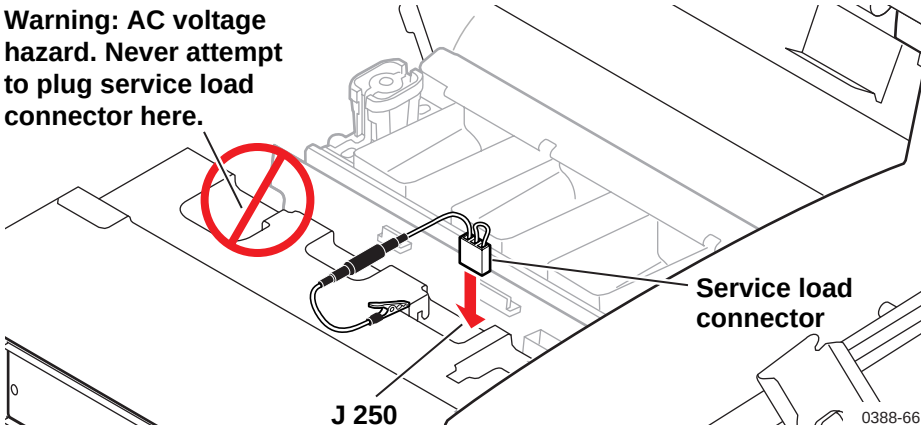


Figure 3-10. Attaching Service Load Connector To J250

4. Turn on the printer. If the rear panel LEDs illuminate (indicating power), the power control board or its loads are current-limiting the power supply. Go to Step 5. If no power is evident (no lit LEDs), replace the power supply.

5. Turn off the printer. Reconnect the +40 volt loopback connector to the power control board; then disconnect all load connectors from the power control board. Turn the printer on. If the rear panel LEDs still do not illuminate, the power control board has a shorted driver and must be replaced. If the LEDs do illuminate, isolate which motor or fan is overloading the power control board and power supply by turning off the printer and sequentially plugging each cable in one at a time and turning on the printer until the power supply is disabled. Replace the defective component. Also refer to the next topic "Testing for a shorted motor."

6. Turn off the printer. Disconnect the two I2C bus cables from the power control board. (This isolates the I/O boards and their solenoid drivers.) If the rear panel LEDs illuminate, isolate which I/O board is shorting or which I2C cable is defective.

7. If the power supply still does not work, replace the power supply.

Testing For A Shorted Motor

1. Reinstall the power supply if removed in the previous procedure.
2. Disconnect the process motor, the Y-axis motor, X-axis motor and the cap/wipe/purge assembly motor wiring harnesses from the power control board.
3. Turn on the printer again to see if it does not overload now that the motors are disconnected from the power supply.

If the power supply is functional, proceed to the procedure, "Testing motor and solenoid resistances," below.

If the motors and solenoids are not shorted, but the power supply still does not function, replace the power control board.

Testing Motor And Solenoid Resistances

1. Turn off the printer and disconnect the power cord.
2. With a DMM set for measuring resistance, test each motor's windings for correct resistance (disconnected from the printer). Refer to Table 3-2. Rotate the motor's drive shaft slightly while taking the measurement.

Table 3-2. Motor And Solenoid Resistances

Motor or solenoid	Resistance (approx.)
Process motor	3 ohms
Y-axis motor	2 ohms
X-axis motor	60 ohms/phase
Paper feed motor	<1 ohms/phase
Maintenance Drawer Camshaft electric clutch	10 ohms
Paper-pick electric clutch	10 ohms
Transfix cam solenoid	45 ohms

Printhead Troubleshooting

NOTE: The Jet Test Page, which may be printed using the Troubleshooting front panel menu and is automatically printed after the Cleaning Page, contains a localized warning when printed on A4-size paper. The warning message suggests that the page be re-printed on wider (A-size) paper. This is because the outer-most jets are not exercised when the print is made on A4-size media. However, the warning should be ignored if the printer is not going to be used with A-size paper. The outer-most jets are never used for A4 images, so there is no penalty unless wider images are made.

Although printhead failures will occur, they will occur at significantly lower rates than in the past. It is important that other parts of the printer related to printhead operation and maintenance (cap/wipe/purge assembly, vacuum module or tubing) be inspected and, if necessary, replaced to avoid unnecessary printhead replacements and service callbacks.

Table 3-1 provides the process for troubleshooting the printhead. As you proceed through the "Action" steps listed in the table, please check the appropriate boxes under "Look for" and "What next" to document the troubleshooting process. If you must replace the printhead, keep a filled-out copy of this table, with the defective printhead and the Weak and Missing Jet stest print. The following steps provide the details to accompany the table.

1. Check the 8-digit serial number of the printhead in the Service Support menu or on the label on top of the printhead before replacing it. Record the number on Line 2 of the checklist. There are two numbers on the printhead; look at the 8-digit number.

2. Check printhead drive voltage (Head Adjust). It is critical that new printheads only be run at the factory default of 128. Often, the Head Adjust has been raised on the old head to extend its life. Adjusting it above 128 will cause the jets to fail on multi-page jobs and increases customer ink usage.

3. Print Service Test Print 2: Weak and Missing Jets. Use this test print to evaluate the cap/wipe/purge assembly and printhead performance.

   If you see ink mixing from one row to the next, (e.g. Medium 46 to Clear 46) this indicates the cap/wipe/purge blade may be damaged. If it is, install a new cap/wipe/purge assembly.

   If you see weak or missing jets, the problem could be caused by the cap/wipe/purge assembly, the vacuum system (tubing, air valve or pump), the printhead, or the printhead data cable. To isolate the problem, begin by checking the

performance of the cap/wipe/purge assembly and vacuum system. (Action Steps 4–8.)

If you see white "pinstripes" spaced 0.25 cm (0.1 inches) apart across the page (but not present on the test page), the problem is **not** with the cap/wipe/purge assembly or printhead. Check for something binding the x-axis (e.g. a cable rubbing the printhead). The x-axis shaft may need to be lubricated.

To lubricate, apply three dabs (1/10-in. diameter) of Nye Rheolube 368F grease on the threads of the x-axis shaft.

4. Visually check the printhead's faceplate. Through close examination of the printhead's faceplate, you can determine if the wiper blade and gasket are damaged.

   If you see any tiny wax droplets inside the ring where the cap/wipe/purge gasket seals against the printhead faceplate (Figure 3-2), the cap/wipe/purge gasket is leaking during purge. This can be caused by a misaligned printhead or a defective gasket. To verify printhead alignment, move the cap/wipe/purge to the purge position and tilt the printhead forward until the upper edge of the gasket touches the faceplate. If the left and right sides touch the faceplate at the same time, the printhead side-to-side alignment is OK and the problem is with the gasket. If not, you'll need to readjust the printhead gap.

   If you see streaks or smudges of wax in the jet area of the printhead's faceplate after a clean cycle (Figure 3-3), the cap/wipe/purge wiper blade is damaged and the cap/wipe/purge assembly needs to be replaced.

5. Visually check the cap/wipe/purge wiper and gasket. Move the printhead all the way back and raise the cap/wipe/purge assembly. Inspect the rubber wiper (Figure 3-4), especially at the ends, for signs of separation or damage to the blade. (See figure 3-5 for damage to printhead.) Gently probe the cap/wipe/purge gasket with fingers or blunt tool for signs of separation from the cap assembly. Replace if defective.

6. Empty maintenance tray and check vacuum and decay time. To check the cap/wipe/purge assembly purge performance, first empty the waste tray. Attach the vacuum gauge (003-1377-00) using a vacuum "T" (131-6819-00) at the metal pipe used to connect to the cap/wipe/purge assembly. Perform the Clean Jets cycle from the Troubleshooting menu on the front panel. Check the Peak vacuum and Decay time to determine if there is a problem with the vacuum system (pump, air valve or tubing) or cap/wipe/purge gasket. The Peak vacuum should be greater than 46 cm Hg (18 in. Hg, 9 psi). If the vacuum is less than 46 cm Hg, then the cap/wipe/purge gasket is leaking or the vacuum pump is defective. To isolate the problem, go to Action Step 8.

NOTE: The Decay time should take about 6 seconds for the Peak vacuum to bleed off to 0 cm Hg.

If there is no Decay time (sudden drop to zero), the cap/wipe/purge gasket is bad.

If the Decay time is longer than 6 seconds, then something is restricting the tubing (ink in tubing) to the air valve or the air valve is bad. Disconnect the tubing between the metal vacuum tube and vacuum module. Blow through the metal vacuum tube to assure the cap/wipe/purge assembly or tubing is not blocked with ink. Replace any part (cap/wipe/purge assembly, tubing, vacuum module, etc.) that is contaminated with ink.

If the vacuum does not bleed off at all, then the air valve is not opening properly or the orifice in the air valve solenoid is blocked. Replace the vacuum module.

NOTE: Checking the cap/wipe/purge assembly performance by looking for the "KISS" effect when the printhead separates from the cap/wipe/purge gasket at the end of a purge cycle is not an accurate method of checking purge performance and it does not work on all solid-ink printers. Use your vacuum gauges!

7. Check the ink distribution in waste tray. The last check is to look at the ink in the waste tray after a single CLEAN cycle. If the cap/wipe/purge assembly and vacuum system are working properly, there should be ink evenly distributed across the waste tray (~3/4 in. wide). (Refer to Figure 3-7.) If not, check the head-to-drum gap. The cap/wipe/purge gasket is leaking.

8. If vacuum is less than 46 cm Hg at metal pipe, check. If the Peak purge vacuum is less than 46 cm Hg (18 in. Hg, 9 psi), check the vacuum at the pump side of the vacuum module **without** the vacuum "T".

   If vacuum is less than 51 cm Hg (20 in. Hg, 9.9 psi), replace the vacuum module.

NOTE: In diagnostics, go to the NVRAM/PE ROM test and select the sub-test "Access NVRAM Read/Write Data." The default is set to 20 V. This will cause the pump to run somewhat louder during the clean cycles.

If vacuum is greater than 51 cm Hg, the cap/wipe/purge gasket is leaking. Replace the cap/wipe/purge assembly.

9. Install a new cap/wipe/purge assembly. After installing a new cap/wipe/purge assembly, it may take from 4–6 front panel Clean cycles before the cap/wipe/purge gasket seals properly. Be sure to verify the new cap/wipe/purge assembly performs properly. (Action Steps 4 to 8.)

10. Install a new printhead only after directed by Action Steps 1–8. If you are not sure the printhead is the problem, change the cap/wipe/purge assembly first.

NOTE: The factory has set the printhead adjustable mounts at the maximum distance from the drum to avoid accidental grinding or crashing with the drum upon installation. Therefore, it is critical that they be properly adjusted so that a good seal will be obtained with the cap/wipe/purge assembly. This should be adjusted while COLD. Once the printer is warmed up and the printhead is HOT, the printhead-to-drum gap MUST be adjusted again.

NOTE: The front panel Head-to-Drum Adjust will time-out after 20 minutes which will result in a 4,015.45 error. To clear the error, cycle power on the printer.

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11. Check for Service Required Errors. After installing the printhead, you may get one of the following service errors due to mis-adjustment or cabling problems:

    4,002.41 and 4,006.45
    Printhead NVRAM all zeroes. If the data cable between the power control board and the printhead is not plugged in properly or damaged (Figure 3-8), this error will occur. Reseat or replace the data cable.

    13,003.35, 13,019.40 and **13,035.47**
    Heater running away. If the data cable is not making a good connection, the incorrect data will be sent to the main board. Reseat or replace the printhead data cable before replacing printhead.

    13,004.43 or **13,020.41**
    Jetstack not heating as quickly as it should. Readjust the left or right head-to-drum adjustment; the jetstack is too close to the drum which prevents it from warming up. If the error reoccurs after the adjustment, replace the printhead.

Additional Printhead Error Codes:

13,001.40 and **13,0017.47**
Open left and right jet stack thermistor. Reseat or replace the data cable. If the error reoccurs, replace printhead. If the new printhead gives the same error, replace the power control board.

13,002.41 and **13,018.48**
Jet stack thermistor appears to be shorted. Reseat or replace the data cable. If the error reoccurs, replace the printhead. If the new printhead gives same error, replace the power control board.

13,033.45
The thermistor in the reservoir appears to be open. If the 4-pin connector on the top of the driver board (Figure 3-9) is disconnected, this error will occur. Turn off the printer and reseat the cable.

13,034.46
Thermistor appears to be shorted. Look to see if the 4 prong plug on the top of the driver board is plugged in correctly. If it is, check the data cable. If the data cable is good, replace printhead. If the error happens on the new printhead, replace the power control board.

13,035.47 and **13,036.48**
Reservoir heater is running away, or reservoir is not heating. With these errors it is most likely a problem with the printhead.

12. Check cap/wipe/purge assembly purge performance. After installing a new printhead, you **must** recheck the cap/wipe/purge assembly (Action Steps 4–7). If the printhead is not installed correctly, the cap/wipe/purge gasket may leak.

NOTE: A broken ink loader can cause the cap/wipe/purge gasket to not seal. Look for signs of breakage of the black plastic parts on the underside, especially the bosses that retain the lowest black plastic panel. Breakage or separation can interfere with head tilt, resulting in a poor seal with the cap/wipe/purge during the purge process. Replace the ink loader if broken or defective.

Table 3-1. Printhead Troubleshooting

ACTION:	LOOK FOR:	WHAT NEXT:
Identify Printhead: **1.** Get printhead serial number.	❑ **1.** Enter serial #: _____	❑ **G**o to ACTION 2**.**
Determine Problem: **2**. Check printhead drive voltage. **3.** rint Service Test Print 2: Weak and Missing Jets.	❑ **2.** Head Adjust setting of 128. ❑ **3A.** color mixing from one row to the next row for same jet. ❑ **3B.** weak or missing jet(s).	❑ **2.** If Head Adjust is not 128, set it to 128. Go to ACTION 3. ❑ **3A.** If so, replace CWP: ACTION 9. ❑ **3B.** If so, go to ACTION 4.
Inspect Printhead and CWP: **4.** Visually check printhead faceplate. **5.** Visually check CWP wiper and gasket.	❑ **4A.** streaks or smudges of wax in the et area of the printhead ❑ **4B.** tiny wax droplets (V-shape) inside the ring where the CWP gasket seals against the printhead faceplate. ❑ **5A.** any separation on the wiper blade, or pitting of the CWP gasket. ❑ **5B.** good visual inspection (4A-5A).	❑ **4A.** If so, wiper is damaged. Replace CWP: ACTION 9. ❑ **4B.** If so, CWP is leaking. Adjust HTD gap, or if gasket is damaged, go to ACTION 9. Otherwise, go to ACTION 5. ❑ **5A.** If so, replace CWP: ACTION 9. ❑ **5B.** If so, go to ACTION 6.

Table 3-1. Printhead Troubleshooting (cont.)

ACTION:	LOOK FOR:	WHAT NEXT:
Check CWP Purge Performance:		
6. Check vacuum and decay time at metal pipe using vacuum "T" during front panel CLEAN cycle.	❑ **6A.** a peak vacuum reading during purge: **Peak vacuum at metal pipe:** _____	❑ **6A. If less than 46 cm Hg** (18 in Hg, 9 psi), go to ACTION 7. **If greater than 46 cm Hg**, go to LOOK FOR step 6B.
	❑ **6B.** the time it takes for the vacuum to decay to 0 cm Hg: **Decay time**: _____	❑ **6B. If decay time is about 6 seconds,** go to ACTION 10. **If there is no decay time** (sudden drop to zero), CWP gasket is bad. Go to ACTION 9. **If decay time is less than 6 seconds,** check metal and rubber tubing for ink. **If decay time is much longer than 6 seconds**, replace vacuum module.
7. f vacuum is less than 46 cm Hg at metal pipe (LOOK FOR 6A), check vacuum at pump side of vacuum module without "T" during front panel CLEAN cycle.	❑ **7.** peak vacuum at pump side of vacuum module without "T" during front panel CLEAN cycle. **Measured vacuum at pump:** _____	❑ **7. If less than 51 cm Hg** (20 in Hg, 9.9 psi), replace vacuum module. **If greater than 51 cm Hg**, go to ACTION 8.
8. Locate source of CWP vacuum leak.	❑ **8A**. plugged tubing between CWP and air solenoid or vacuum module. ❑ **8B**. misaligned CWP belts. ❑ **8C.** misaligned printhead-to-drum. ❑ **8D**. interference with printhead tilt mechanism.	❑ **8A**. Replace rubber or metal tubing and go to ACTION 6. ❑ **8B**. Align belts and go to ACTION 6. ❑ **8C**. Align HTD and go to ACTION 6. ❑ **8D**. Repair mechanical interference and go to ACTION 6.
Install NEW CWP:		
9. Install new CWP. Do up to 6 purge cycles to test performance.	❑ **9.** good CWP purge performance.	❑ **9**. **New CWP may take 4-6 purges** before optimal performance. Go to ACTION 6.
Retest print quality:		
10. Print Service Test Print 2: Weak and Missing Jets.	❑ **10**. weak or missing jet(s).	❑ **10**. If no weak or missing jets, repair is complete. Print quality is OK. If PQ not OK, go to ACTION 11.
Install NEW Printhead		
11. Install a new printhead only after completing previous steps. **Note:** *If you have not replaced the CWP and you're not confident the printhead is defective, change the CWP.*	❑ **11**. left and right HTD adjustments are equal at HOT adjustment. **Note:** *Hot printhead adjustment must be performed for good purge performance and good print quality.*	❑ **11.** If HTD adjustment is uneven from side-to-side, CWP will not purge properly. Adjust HTD and go to ACTION 12.
12. Check printhead drive voltage.	❑ **12.** Head Adjust setting of 128.	❑ **12.** If Head Adjust is not 128, set it to 128 and go to ACTION 13.
13. Check for Service Required Errors.	❑ **13A.** 13,004.43 or 13,020.41 errors: etstack not heating as quickly as it should.	❑ **13A**. Readjust HTD: left or right side of printhead is too close to drum. If error reoccurs, replace printhead.
	❑ **13B**. 13,001.40, 13,002.41, 13,003.42, 13,017.46, 13,018.48 and 13,035.47.	❑ **13B.** Reseat printhead ribbon cable before replacing printhead.
14. Check CWP purge performance: ACTION 6.	❑ **13C**. 4,002.41 and 4,006.45 errors: rinthead NVRAM all zeroes.	❑ **13C.** Check printhead ribbon cable before replacing power control board (followed by printhead).
	❑ **14**. good purge performance with NEW printhead.	❑ **14.** If purge performance is good, go to ACTION 10 to verify.

Figure 3-1 shows what a printhead faceplate will look like after a good cap/wipe/purge blade wipe. Notice that there are **no** smudges or streaks of ink in the nozzle area.

Figure 3-1. Good Cap/Wipe/Purge Blade Wipe

Figure 3-2 shows a close-up of the printhead faceplate identifying the tiny drops of ink that indicate a cap/wipe/purge gasket leak. Notice the “V” or funnel shape the droplets form just under the area where the cap/wipe/purge gasket seals against the faceplate (ink stain). Random drops can be ignored.

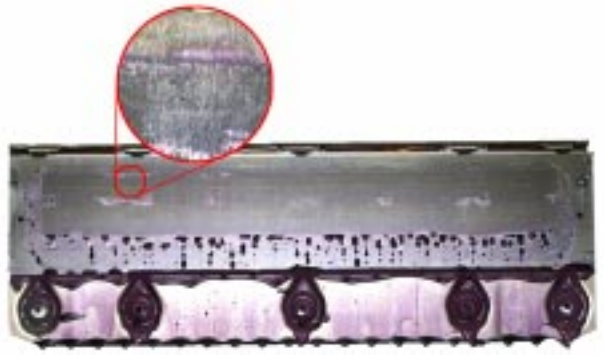

Figure 3-2. Cap/Wipe/Purge Gasket Leaking

Figure 3-3 shows the affect on the printhead when the cap/wipe/purge blade is not working . In this example, the blade has several (6) defects. In most cases, you will probably only see one smudge or streak.

Figure 3-3. Bad Cap/Wipe/Purge Blade Wipe

Figure 3-4 shows a close-up of one of the damaged areas of the cap/wipe/purge blade used on the printhead shown in Figure 3-3. The edge of the blade is pushed inward and flattened which prevents a good wiping action. In most cases you will not be able to see the damage to the blade, however, you will see its affect on the printhead faceplate as streaks or smudges of ink in the nozzle area.

Figure 3-4. Cap/Wipe/Purge Blade Damaged

Figure 3-5 shows a close-up of the left side of a printhead. Here the cap/wipe/purge blade has separated allowing the metal spring to rub the faceplate and damage the printhead.

Figure 3-5. Cap/Wipe/Purge Blade Separated

Figure 3-6 shows a bad purge due to a lack of vacuum.

Figure 3-6. Bad Purge

Figure 3-7 shows a good purge.

Figure 3-7. Good Purge

Figure 3-8 shows a bad printhead data cable. Part of the cable is separated from the connector.

Figure 3-8. Bad Printhead Data Cable

Figure 3-9 shows the thermistor cable which connects to the driver board disconnected. This can happen while installing the ink loader.

Figure 3-9. Thermistor Cable Unplugged

Media Jams And The Paper Path

Required tools:

- TORX screwdriver and tips
- Digital multimeter

Jams fall into the following four categories:

- Media-based problems
- Paper-pick errors
- Paper-feeding errors
- Paper-ejecting errors

Media-Based Problems

1. Fanning the media eliminates its tendency to double-pick.
2. Inspect the paper for bent, torn or folded corners.
3. Check to ensure no small pieces of paper are in the paper path.
4. Ensure that the correct media is in the correct media tray. The tray switch actuators indicates the size and the type of media loaded in the tray; the printer does not directly sense the size or type of media.
5. Ensure that only Sterling-specified paper is being used.

Paper-Pick Errors

Paper-pick errors occur when the media in the media tray mispicks or the printer double-picks two or more sheets of paper.

1. Fan the media before inserting it in the media tray.
2. In humid environments, keep media sealed in packaging until it is needed for printing.
3. Ensure that the media fits properly in the tray. With the left edge of the stack of paper flush against the tray rail, there should be a small gap between the right edge of the stack of paper and the opposite side rail.
4. Clean the interior of the media tray. When installing paper, push the stack of paper down until the tray's lift-plate locks to the bottom of the tray. This prevents the top sheet of paper from being mispositioned as the tray is inserted in the printer.
5. Check that the pick roller is being rotated. In its starting position, the pick roller's flat side should face down; the flat, keyed end on the left end of the pick roller shaft faces up. If it is not, proceed to the topic "Checking the process motor and drive train."
6. Clean the pick roller with alcohol and a lint-free cloth. Paper dust can coat the pick roller and affect its ability to grip the paper and pull it out of the tray. Also clean the transport rollers.
7. Use the PC-based diagnostic's "Verify Drive Current Requirements" test to check the operation of the paper-pick system.
8. Inspect the wiring harness leading to the paper transport clutch for nicks, cuts or crimped wiring. Ensure the connector is seated.
9. Inspect the paper-feed path for obstructions.

Print Transfer Jams

1. Using PC diagnostics, test the paper preheater. If the test fails, replace the paper/drum heater assembly.
2. Check to see if the upper feed roller drive belt is broken or slipped off of its pulleys. In such a case, the upper feed roller does not rotate when the lower feed roller rotates.
3. Check that the feed rollers rotate smoothly and that the front cover is fully closed and seated.

4. Check the paper-eject path for obstructions. Ensure no small pieces of paper are trapped around the stripper fingers.

   If a piece of paper is trapped in the paper preheater, try pushing it out by inserting a stiff piece of cardstock into the paper preheater.

5. Ensure that the transfix roller rotates during the transfix process.

6. Test the sensors in the paper path. Look for damaged or nonoperating sensor flags.

7. Check the transfix solenoid and its cam. Ensure they operate correctly and are properly lubricated.

Checking The Process Motor And Drive Train

1. Determine if the process motor runs. If it does not rotate, go to Step 2. If it does rotate, go to Step 5.

2. Measure to determine if +40 VDC is being supplied to the motor. If it is, go to Step 3. If it is not, inspect the process motor's wiring harness. If the harness is functional, then troubleshoot the power control board and power supply. Refer back to the topic, "Verifying Power Supply Operation."

3. Disconnect the motor's wiring harness. Measure the resistance of the motor's windings. The expected resistances are listed in Table 3-2. If the windings are opened, shorted or far out of tolerance, replace the motor.

4. If the motor's winding resistances are within specification, inspect the wiring harness for nicks, crimps, opens or other problems. If the harness is functional, then replace the power control board.

5. Inspect the gear train on the inside of the printer frame; look for stripped gears or broken teeth. Be sure to inspect the inner teeth on the process motor gear.

Media Skews Passing Through The Paper Path

1. Check to see if the media is excessively curled. Curled media can get mistracked in the paper path.

2. Examine the paper path; ensure it is clear of obstructions.

3. Ensure that the pick roller is clean so that it picks up a sheet of media smoothly and evenly.

4. Check the upper and lower feed rollers. Also make sure that the front door is properly closed.

5. Check the flexible, white paper deskew springs on the inside of the front cover. Ensure none are bent, damaged, or missing.
6. The printer should be installed on a flat, level surface.

Printing And Print Quality Problems

Generally, print problems fall into the following six categories:

- Streaks or lines in the prints
- No printing
- Printing too light or too dark
- Poor quality printing
- Image is offset or cut off
- Wrinkling

Streaks Or Lines Across The Print

1. Check the Y-axis belt tension. If the Y-axis drive is not smoothly and consistently rotating the drum, horizontal bands or lines appear in the print.
2. Replace the Y-axis motor.
3. Replace the power control board.

Streaks Or Lines Down The Print

1. Clean the blade of the drum maintenance drawer.
2. Possible missing or weak jet. Print the Service Test Print 2, Weak/Missing Jets, to determine if a jet is not performing. Perform up to three printhead cleaning cycles to try to clean a clogged jet.
3. If necessary, turn off the printer and allow the printhead to cool for 4 hours.
4. Test the vacuum system for proper vacuum levels and operation.
5. Ensure that no wiring harnesses are interfering with the horizontal slewing of the printhead. In such a case, the streaks or lines should be parallel and evenly spaced.
6. Check for media in the exit path.

7. The x-axis drive is not functioning correctly. If the x-axis drive does not slew the printhead smoothly and evenly during printing, vertical lines appear in the print. Print Service Test Print 11, X-axis Calibration, to reveal an x-axis problem. Replace the X-axis drive, if indicated.
8. Replace the x-axis drive assembly.
9. Replace the power control board.
10. If streaks are on the front side of a print, the paper preheater may be scraping ink off the print. Clean the preheater using the front panel-initiated cleaning process, Remove Ink Smears.
11. Smears on a print may also be caused by the paper preheater operating at a too-high temperature. Use the PC diagnostics to check the paper preheater's temperature. Replace if necessary.

Missing Ink Or Low Density Ink Band Running Length of Print

Possible missing or weak jet.

1. Print the Service Test Print 2, Weak/Missing Jets, to determine if a jet is not performing. Perform up to three printhead cleaning cycles to try to clean a clogged jet.
2. If necessary, turn off the printer and allow the printhead to cool for a minimum of 4 hours.
3. Ensure the printhead maintenance vacuum system operates correctly.
4. If weak or missing jet cannot be recovered, replace the printhead.

Scratches parallel to the long axis of printing

Usually caused by foreign debris in the paper path.

1. Run a sheet of paper through the manual feed to see if the scratch appears on the print. If it does not, the scratch occurred in the paper pick and early transport of the paper.
2. A scratch or smear caused by the paper preheater can be caused by debris built up on the heating surfaces. Run the front panel cleaning procedure Remove Ink Smears. Additionally, you can manually force a sheet of thick 65 to 80 lb. paper through the paper preheater to "buff" the paper preheater heating surfaces. With the leading and trailing ends of the sheet of paper extending from the entry and exit of paper preheater, gently pull the sheet of paper back and forth several times and then remove the sheet of paper. Be careful of the paper sensor flags.

White Portion Of Image Is Dark

Ink on a print where no ink should be printed is often called a latent image. A latent image remains on the drum when it should have been transferred to its sheet of paper. An insufficient amount of oil on the drum, provided by a dirty, defective or old maintenance roller may be the problem.

1. Clean the wiper blade of the drum maintenance drawer. If necessary, replace the maintenance kit.
2. Run diagnostics to ensure that printer temperatures are in tolerance. Ensure that the drum heater is properly positioned. Ensure that the customer is using Sterling-specified paper. Some recycled paper brands may be too rough.
3. Replace the power control board.
4. Replace the printhead data cable.
5. Replace the main board.
6. Replace the printhead.

Grayscale Density Is Uneven

This may be due to poor thermal regulation in the printer, resulting in uneven heating of the printhead, which in turn results in uneven ink drop jetting.

1. Clean the wiper blade and the wick of the drum maintenance drawer. Inspect the operation of the drum maintenance cam roller and the left and right cam actuators it pushes against.
2. Perform the procedure, “Printhead-To-Drum Spacing Adjustment” and “Transfix Roller Pressure Spring Adjustment”.
3. Replace the printhead.

Not Printing

The printer processes a sheet of paper, but no image is printed on it.

If you do not get ink on the print, but you get ink in the waste liner during a cleaning cycle, replace the printhead data cable.

If you do not get ink on the print or during a cleaning cycle:

1. Check the cap/wipe/purge performance.
2. Check for a loose connector on the power cable leading to the printhead. Replace the printhead power cable.

3. Replace the power control board.
4. Replace the printhead.

Printing Too Light Or Too Dark

Perform the procedure, “Printhead-To-Drum Spacing Adjustment.”

Fuzzy text

Text appears indistinct and difficult to read.

1. Head-to-drum gap is too great. Verify the gap with the adjustment as explained in the topic “Printhead-To-Drum Spacing Adjustment.”
2. Verify the drum temperature using PC-based diagnostics. Ensure the drum temperature sensor is clean and properly positioned.
3. If the problem persists, replace the printhead.

Poor Ink Fills

Primary fills appear banded and inconsistent.

1. Head-to-drum gap is too small. Verify the gap with the adjustment explained in the topic “Printhead-To-Drum Spacing Adjustment.”
2. Verify the drum temperature using PC-based diagnostics. Ensure the drum temperature sensor is clean and properly positioned.
3. Verify the paper preheater temperature using PC-based diagnostics.
4. If the problem persists, replace the printhead.

Poor Small Text Resolution

Small characters appear heavy and “plug up.”

1. Verify the drum temperature using PC-based diagnostics. Ensure the drum temperature sensor is properly positioned.
2. Inspect and clean the drum temperature sensor.
3. Ensure that the X-axis drive system is correctly assembled and lubricated.
4. If the problem persists, replace the printhead.

Ghosting

Drum is too warm.

Verify the drum temperature using PC-based diagnostics. Ensure the drum temperature sensor is clean and properly positioned.

Ghost Of First Print On The Next Print

Incomplete image transfer is taking place on the first print.

1. Inspect the drum maintenance system. Does the drum maintenance roller contain sufficient oil? Replace the drum maintenance roller (and counter chip), if necessary.
2. Is the drum maintenance cam roller and electric clutch operating correctly? Test them using PC-based diagnostics.
3. Ensure the left and right drum maintenance actuators operate correctly when lifted by the cams of the drum maintenance cam roller.

Vertical Lines Appear Wavy

Straight vertical lines appear to be wavy and ill-formed.

1. Too much oil on the drum. Inspect the drum maintenance drawer. Is the wiper blade damaged? If necessary, replace the drum maintenance drawer.
2. Are the drum maintenance cam roller and electric clutch operating correctly? Test them using PC-based diagnostics.
3. Ensure the left and right drum maintenance actuators operate correctly when lifted by the cams of the drum maintenance cam roller.

Oil Streaks On Print

Oil stains the edge of the print.

1. Inspect the drum maintenance drawer. Is the wiper blade damaged? If necessary, replace the drum maintenance drawer.
2. Are the drum maintenance cam roller and electric clutch operating correctly? Test them using PC-based diagnostics.
3. Ensure the left and right drum maintenance actuators operate correctly when lifted by the cams of the drum maintenance cam roller.

Poor Ink Adhesion, Poor Image Durability

1. Verify the paper preheater temperature using PC-based diagnostics.
2. The drum is too cold. Verify the drum temperature using PC-based diagnostics. Ensure the drum temperature sensor is properly positioned and has no contamination between it and the drum surface.
3. Try a different ream of paper.
4. The transfix spring pressure is incorrect. Perform the procedure “Transfix roller pressure spring adjustment”.

Incomplete Image Transfer To Paper

All of the image does not transfer to the paper. Part of the image remains on the drum to be picked up by a chase page or the next print. This is usually caused by insufficient or nonuniform drum oiling.

1. Inspect the drum maintenance drawer. Is the wiper blade damaged? If necessary, replace the drum maintenance drawer.
2. Inspect the drum maintenance system. Does the drum maintenance roller contain sufficient oil? Replace the drum maintenance roller, if necessary.
3. Are the drum maintenance cam roller and electric clutch operating correctly? Test them using PC-based diagnostics.
4. Ensure the left and right drum maintenance actuators operate correctly when lifted by the cams of the drum maintenance cam roller.
5. The drum may be too warm. Verify the drum temperature using PC-based diagnostics. Ensure the drum temperature sensor is properly positioned and has no contamination between it and the drum surface.
6. Verify the paper preheater temperature using PC-based diagnostics.
7. Try a different ream of paper.

Repeating Print Defects On Print

The distance between each artifact of a repeating image defect reveals which imaging component is causing the defect.

1. Repeating defect 13.6 cm (5.34 in.) in the vertical direction are caused by the transfix roller.

2. White or dark lines parallel to the long edge of the print, spaced 1.4 mm (0.054 in) in solid fills, using High Resolution Medical printing mode indicate the x-axis step accuracy is incorrect. Ensure the long spring mounted underneath the printhead is intact and not contaminated with ink; remove the maintenance drawer to access the underside of the printhead. Inspect the x-axis drive system; replace it if necessary.

Banding Parallel To Long Edge Of Print

Fills are inconsistent with wide bands of varying density.

1. The head-to-drum gap is too great. Perform the procedure, “Printhead-To-Drum Spacing Adjustment.”
2. If the problem persists, replace the printhead.

Wrinkling

1. Try different media from a sealed package. In high-humidity environments, paper left exposed (unpacked) absorbs moisture and begins to warp.
2. Ensure the deskew fingers inside the front cover are not damaged or missing.
3. Inspect the maintenance drawer wiper blade. Replace the maintenance drawer, if necessary.
4. The transfix spring pressure is incorrect. Perform the procedure “Transfix Roller Pressure Spring Adjustment”.
5. Replace the drum/transfix assembly.

Image Is Offset Or Cut Off

1. Check the application for the correct image sizing and orientation.
2. Ensure that Letter or A4 is the selected paper size.

Oil Streaks On Top Of Print

1. Clean the stripper fingers.
2. Run chase pages through the printer to clean the drum. Use the front panel menu item “Remove Ink Smears” under “Troubleshooting.”
3. Clean the maintenance drawer blade or replace the maintenance kit.

Image Is Rotated 90 Degrees

1. In the application’s Page Setup, make sure that the image is selected to print in Portrait or Landscape orientation, as you expect.

Printer isn’t in the Chooser

1. Ensure that the printer is turned on and the rear panel health light is flashing at a regular rate.
2. Check the Network or AppleTalk control panel to ensure the proper network or zone is selected.
3. Check to see if the printer has not been renamed or placed in another zone. You can print a Configuration Page, which lists this EtherTalk information as well as other information about the printer.

PC-based Diagnostics

The PC-based diagnostics is provided for interactively testing the operations and functionality of the printer. The diagnostics are provided on a 3-1/2 inch floppy diskette. All of the diagnostic tests are started from the PC and are downloaded to the printer.

The PC-based diagnostics were developed to run on a PC as this is the portable computer in use by the field service organization.

Requirements

- Printer serial cable adapter (level shifter), P/N 012-1543-00.
- Serial null modem cable, P/N 012-1535-00.
- IBM PC or PC-clone or compatible, preferably a Pentium® or 486; 286-based PCs are intolerably slow.
- At least 640K of RAM. About 2 Mbytes of disk space to store the diagnostic program and its test suite.
- A mouse is optional, but is not supported by the user interface.
- MS-DOS environment. This may be Windows® DOS or MS-DOS on a PC.

By convention, each set of diagnostic files is installed into a single directory (for ease of removal and updating); `C:\100DIAGS\<version number>\` is the default (i.e.: `C:\100DIAGS\1128`)

Starting The Diagnostics

1. Turn off the printer and the Service Laptop computer. Connect the serial port of the computer to the special diagnostic, 5-pin serial port of the printer; using the special serial cable adapter. (Pin 1 is the left-most pin of the five pin connector, looking at the back of the printer).
2. Push down Switch 1, the service mode DIP switch. (The switch is the left-most of the four DIP switches on the rear panel of the printer, looking at the back of the printer) The other switches should be up.
3. Using the serial null modem cable, connect the serial port adapter to the COM1: serial port on the PC.
4. Turn on the PC in DOS mode. Older versions of Windows 95 will only run the PC-based diagnostics if the computer is booted in DOS mode; they will not run the diagnostics from the MS-DOS Prompt application.

5. Set the PC's comm port to COMM1. Set the baud rate to 19.2 kbaud, 8 data bits, 1 stop bit and no parity.

6. In your DOS window, go to the `C:\` prompt.

7. To install the diagnostics from a diskette onto your computer, type: `A:INSTALL /all <return>`.

8. Connect to the directory containing the diagnostic software (`C:\100DIAGS`). Launch the diagnostics program by typing `diags xxx`, where `xxx` is the name of the print engine firmware level. (Typing `diags` lists the available diagnostic versions.) Once launched, the program repeatedly attempts to communicate with the printer. The link status indicator, in the bottom-right corner of the screen, reads "NO" until this link is established; once communication is established, it reads "OK."

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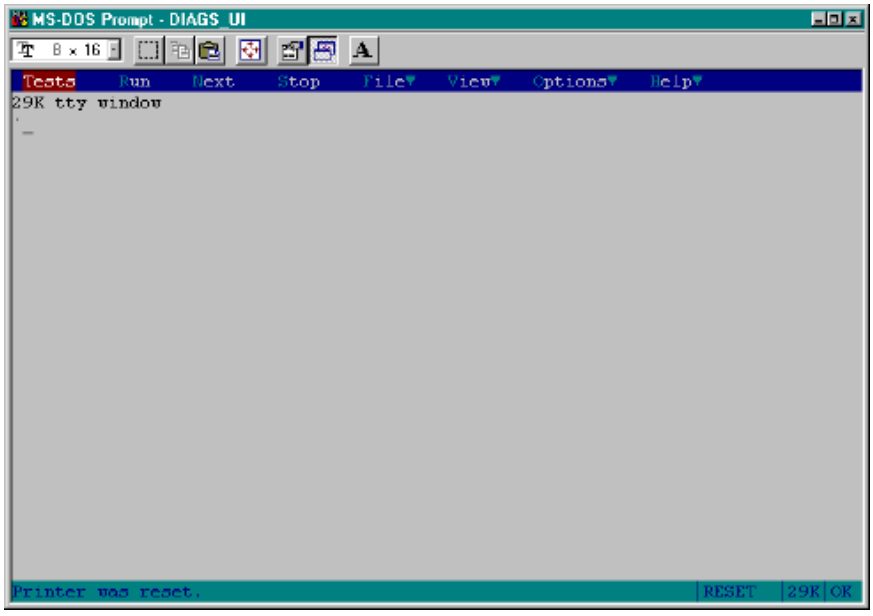
*NOTE: The Comm Port should be set to 57.6 kb **after** communication is established with the printer. The baud rate can be set faster for quicker test downloading. If the printer's power is cycled, the PC's baud rate must be reset to 19.2 Kb to reestablish communication with the printer.*

PC-based Diagnostics Screen Display

Once communication with the printer is made, the diagnostics display the startup screen on the computer.



The startup screen features the following elements:

- A conventional-looking Menu Bar across the top of the screen; all diagnostic functions are accessible via this menu.
- The middle of the screen is a blank gray area; this is a 23 x 80 “tty” in which all interaction takes place with the tests when they are running.
- The bottom line of the screen gives feedback about the state of the system. It is divided into four fields:
  - The left-most, and largest field is the “message” field. It contains descriptive text summarizing the operation of tests in progress and of the diagnostics program itself.
  - Next is the completion indicator. When downloading test files to the printer, this field indicates the progress of the operation with a percentage-complete display “n%” (where n is 0 to 100). When running a lengthy series of tests, a display “n of N” indicates the test progress.
  - Third is the “view” field. This indicates which “channel” is being viewed in the tty screen. The 29K channel displays information related to the communication line. The 68K channel displays information related to the printer and the diagnostic tests.
  - In the bottom-right corner is a tiny field which indicates the status of the communication link between the PC and the printer’s processor. It says “OK” when the link is working and “NO” when communication is lost.

Selecting Tests

Press **Alt-T** or move the highlight block to the **Tests** pull-down menu and press **Return** to activate the test selection window.

Use the following keys to navigate the lists of tests. The left column, Test Suites, lists the groups of test. The center column shows the individual tests within a selected test suite. The right column, “Status,” indicates if a test is selected. You can select a single test, a series of tests, or all the tests is a test suite.

In the Test Suites column:

- **Up** and **Down arrows** – Move the Test Suite selection highlight block up or down on the screen. When the highlight block reaches the top or bottom of the screen, it causes the list to scroll if there are more tests in that direction on the list.
- **Tab** or **Right arrow–** Activates a suite of tests. The individual tests of the selected test suite are displayed in the Individual Test column.

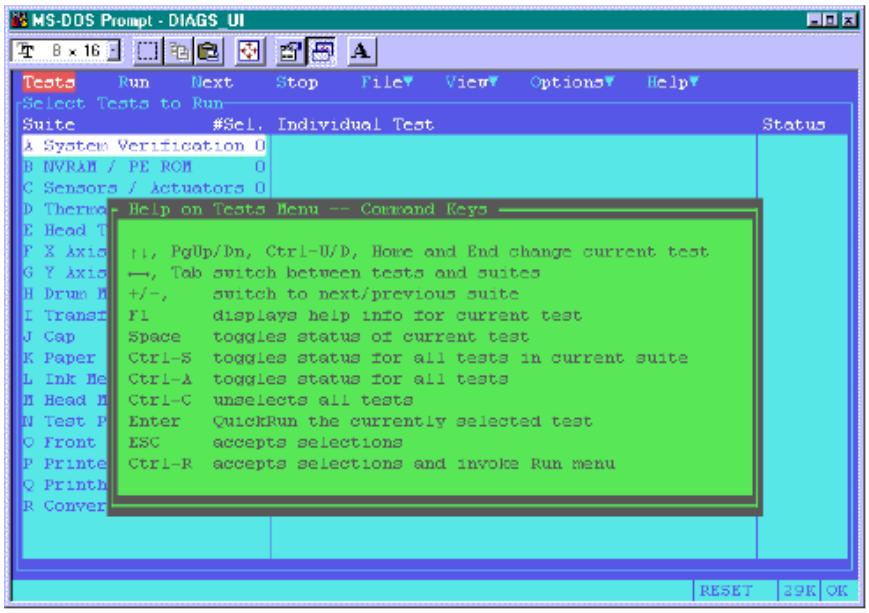
Alternately, select a test by typing its corresponding letter instead of using arrow keys.

- **PgUp** and **PgDn –** Move the display of tests one screen-full at a time. The highlight block generally stays in place on the screen, so this also changes the highlighted test.

In the Individual Test column:

- **Up** and **Down arrows** – Move the Individual Test selection highlight block up or down on the screen. When the highlight block reaches the top or bottom of the screen, it causes the list to scroll if there are more tests in that direction on the list..
- **Space bar** – Toggles the Status of the currently highlighted test: to “Selected” if the test is not selected and to not selected if it is already selected.
- **Left arrow** - Moves back to the Test Suite column.
- **Alt-S** – Toggles the Status of all tests in the Suite which contains the currently highlighted test: all to Selected if the currently highlighted test is not selected and all to not selected if it is anything else. The status of the other tests in the suite is immaterial.
- **Alt-A** – Toggles the Status of ALL tests. Like Alt-S, the new setting for all tests is based on the currently highlighted test, regardless of the individual settings of the other tests.
- **Alt-R** – Selects the currently highlighted test and opens the Run window to prepare to execute the currently selected test.

Diagnostics Global Help Screen

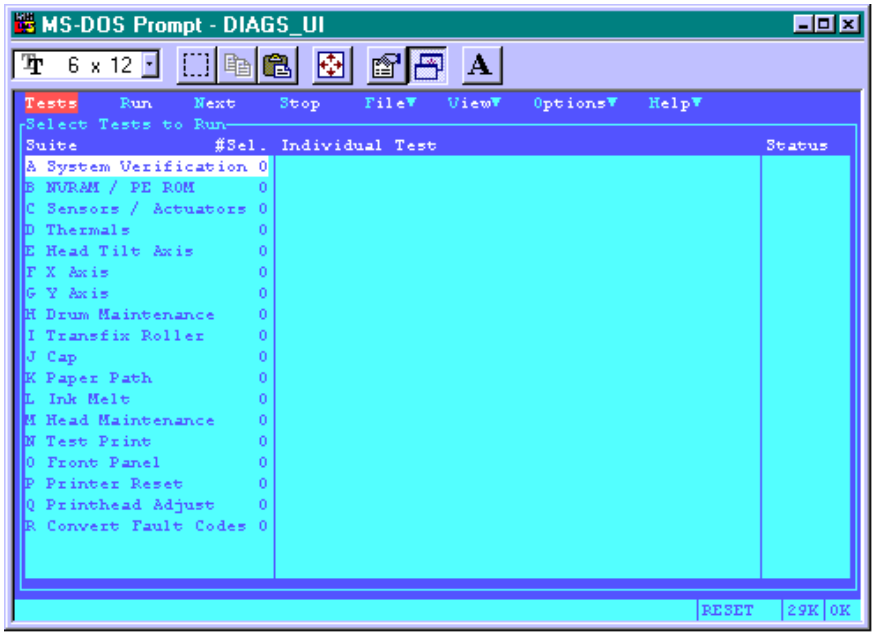


- **Alt-H** – Opens a small Help window to remind which functions are available. **Esc** or **Enter (Return)** make it go away.
- **F1** – Brings up a more complete description about the currently highlighted test.
- **Esc** and **Enter (Return)** – Either key replaces the selection screen with the current tty window. Any currently selected test remains selected.

Running Tests

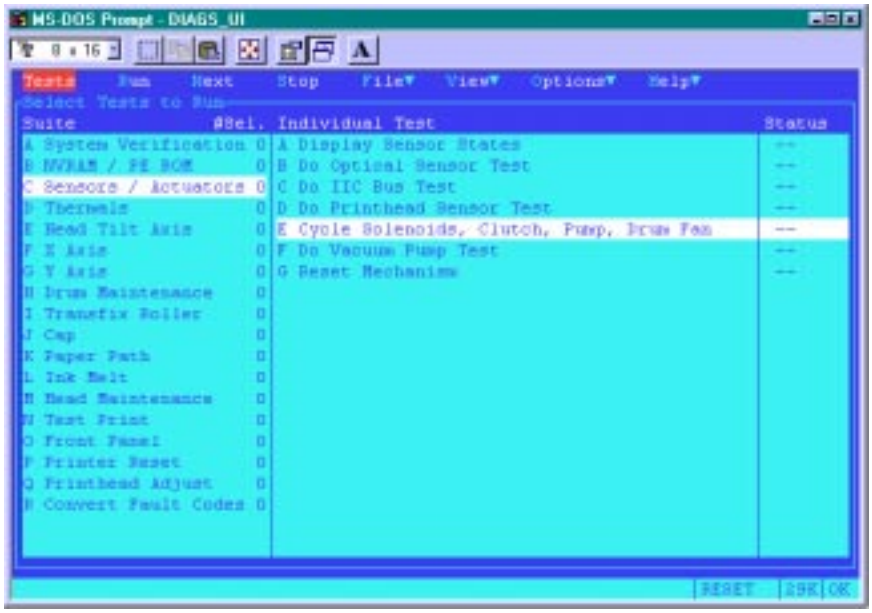
Tests are downloaded from the PC to the printer. When a downloadable test is selected, it takes a few moments to download the test. While the test is downloading, the message bar indicates this fact and the completion indicator shows how much of the file has been loaded.

Test Suite List

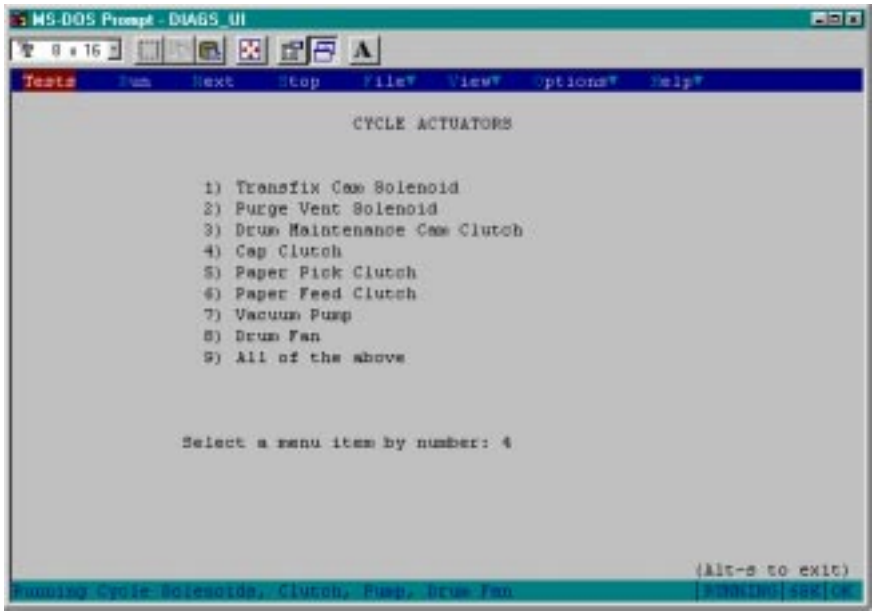

MS-DOS Prompt - DIAGS_UI
6 x 12
Tests Run Next Stop File View Options Help
Select Tests to Run
Suite #Sel. Individual Test Status
A System Verification 0
B NVRAM / PE ROM 0
C Sensors / Actuators 0
D Thermals 0
E Head Tilt Axis 0
F X Axis 0
G Y Axis 0
H Drum Maintenance 0
I Transfix Roller 0
J Cap 0
K Paper Path 0
L Ink Melt 0
M Head Maintenance 0
N Test Print 0
O Front Panel 0
P Printer Reset 0
Q Printhead Adjust 0
R Convert Fault Codes 0
RESET 29K OK

1. Press the **Return** key to enter the test group selection window.
2. Use the arrow keys to scroll through the list of tests suites. Press the **Tab** key or the right arrow to select a test suite.

Once you select a test suite, the individual tests of that suite are displayed.


MS-DOS Prompt - DIAGS_UI
Tests Run Next Stop File Options Help
Select Tests to Run
Suite #Sel. Individual Test Status
A System Verification 0 A Display Sensor States --
B NVRAM / PE ROM 0 B Do Optical Sensor Test --
C Sensors / Actuators 0 C Do IIC Bus Test --
D Thermals 0 D Do Printhead Sensor Test --
E Head Tilt Axis 0 E Cycle Solenoids, Clutch, Pump, Drum Fan --
F X Axis 0 F Do Vacuum Pump Test --
G Y Axis 0 G Reset Mechanism --
H Drum Maintenance 0
I Transfix Roller 0
J Cap 0
K Paper Path 0
L Ink Belt 0
M Head Maintenance 0
N Test Print 0
O Front Panel 0
P Printer Reset 0
Q Printhead Adjust 0
R Convert Fault Codes 0
RESET 29K OK

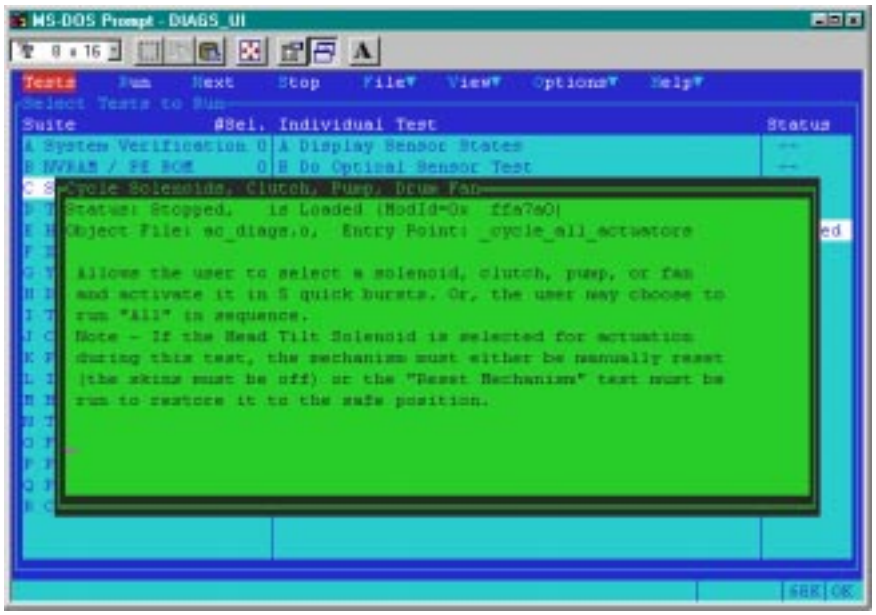
3. Use the arrow keys to highlight a particular test.
4. Press the space bar to select or deselect a test. You can select as many tests as you like.
   To run a highlighted test once, press the Return key.


MS-DOS Prompt - DIAGS_UI
Tests Run Next Stop File Options Help
CYCLE ACTUATORS
1) Transfix Cam Solenoid
2) Purge Vent Solenoid
3) Drum Maintenance Cam Clutch
4) Cap Clutch
5) Paper Pick Clutch
6) Paper Feed Clutch
7) Vacuum Pump
8) Drum Fan
9) All of the above
Select a menu item by number: 4
(Alt-s to exit)
Running Cycle Solenoids, Clutch, Pump, Drum Fan
29K OK

5. After selecting the test(s), press **Ctrl-R** to start the test(s) specifying the number of test cycles to run. The tests run in the order they appear in the menu. Depending on the test, a screen may be displayed to modify how the tests run.

The solenoid and clutch test, shown above, allows you to selectively actuate a printer solenoid or clutch as well as the drum fan.

NOTE: Some test groups have a Choices option which allows for specification or selection of parameters which may influence the operation of successive test in the current test group. The selections are lost when another test group is loaded.

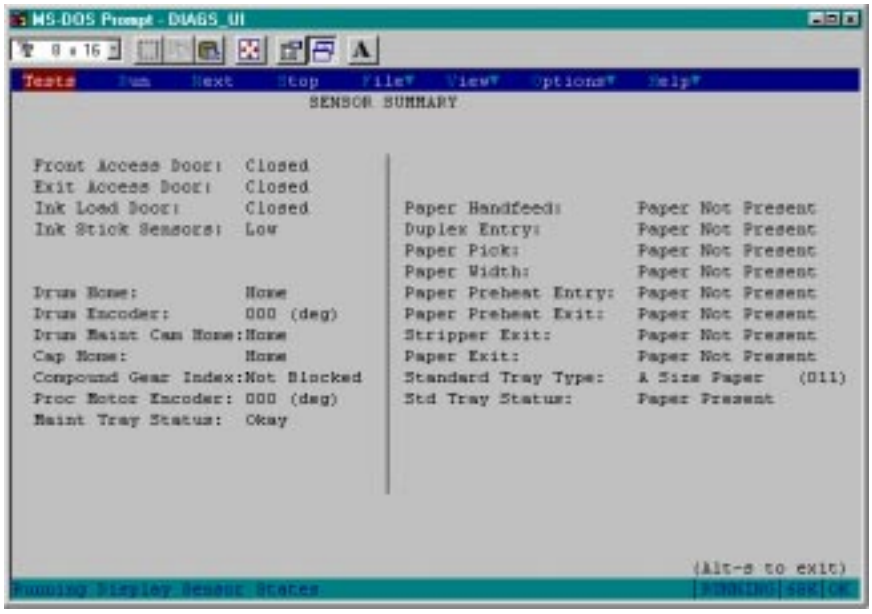

MS-DOS Prompt - DIAGS_UI
Tests
Run
Next
Stop
File
View
Options
Help
Select Tests to Run
Suite
#Sel.
Individual Test
Status
A System Verification 0
A Display Sensor States
B NVRAM / PE ROM 0
B Do Optical Sensor Test
Cycle Solenoids, Clutch, Pump, Drum Fan
Status: Stopped, is Loaded (ModId=0x ffa7a0)
Object File: ac_diags.o, Entry Point: _cycle_all_actuators
Allows the user to select a solenoid, clutch, pump, or fan and activate it in 5 quick bursts. Or, the user may choose to run "All" in sequence.
Note - If the Head Tilt Solenoid is selected for actuation during this test, the mechanism must either be manually reset (the skins must be off) or the "Reset Mechanism" test must be run to restore it to the safe position.
SRK|OK

If necessary, you can highlight an individual test and press the F1 key to display a help message that describes the test.

There are a few tests (Sensor Test, Thermal Test and Fault History) that are very infomative when trying to determine the status of individual parts of the printer. They are described below in more detail.

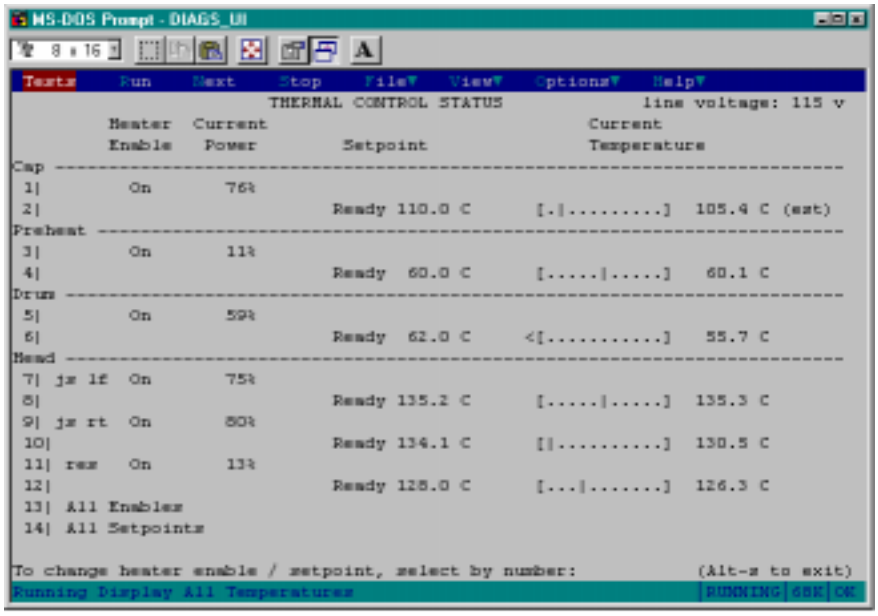
Sensor Test

The Sensor Test shows you the real-time state of the printer's sensors. You can manually test the sensors to determine if they operate correctly.


MS-DOS Prompt - DIAGS_UI
Tests Run Next Stop File Y View Y Options Y Help Y
SENSOR SUMMARY
Front Access Door: Closed
Exit Access Door: Closed
Ink Load Door: Closed
Ink Stick Sensors: Low
Drum Home: Home
Drum Encoder: 000 (deg)
Drum Maint Cam Home: Home
Cap Home: Home
Compound Gear Index: Not Blocked
Proc Motor Encoder: 000 (deg)
Maint Tray Status: Okay
Paper Handfeed: Paper Not Present
Duplex Entry: Paper Not Present
Paper Pick: Paper Not Present
Paper Width: Paper Not Present
Paper Preheat Entry: Paper Not Present
Paper Preheat Exit: Paper Not Present
Stripper Exit: Paper Not Present
Paper Exit: Paper Not Present
Standard Tray Type: A Size Paper (011)
Std Tray Status: Paper Present
(Alt-s to exit)
Running Display Sensor States

Thermal Test

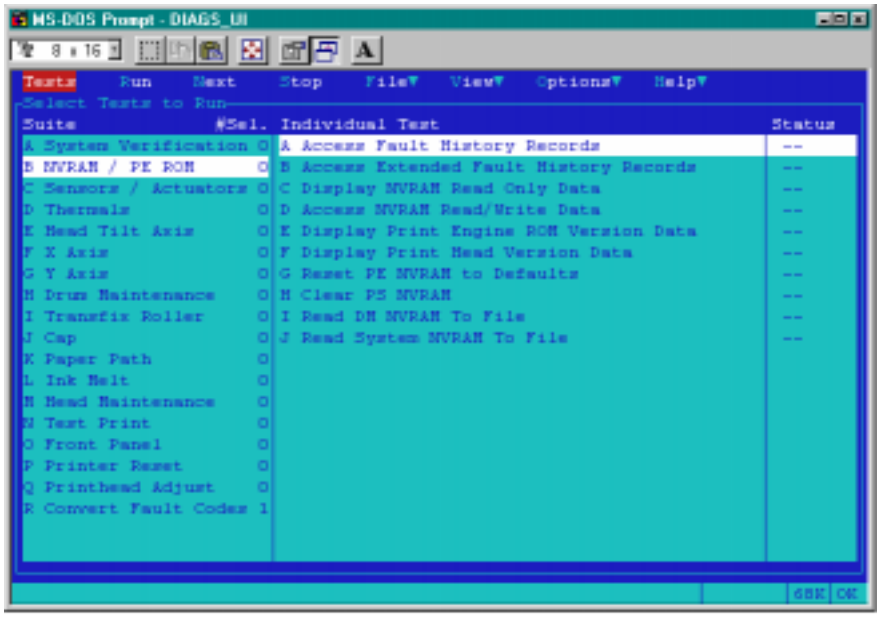
The Thermal Tests let you select, start and observe the operation of the printer's heaters and determine if they are operational. The test displays the real-time temperature of active heaters. A graphic display illustrates if the heater temperatures are within tolerance.


MS-DOS Prompt - DIAGS_UI
Tests Run Next Stop File View Options Help
THERMAL CONTROL STATUS
line voltage: 115 v
Heater Enable
Current Power
Setpoint
Current Temperature
Cap
1| On 76%
2| Ready 110.0 C [.|.....] 105.4 C (ext)
Preheat
3| On 11%
4| Ready 60.0 C [.....|.....] 60.1 C
Drum
5| On 59%
6| Ready 62.0 C <[.....] 55.7 C
Head
7| jr lf On 75%
8| Ready 135.2 C [.....|.....] 135.3 C
9| jr rt On 80%
10| Ready 134.1 C [|.....] 130.5 C
11| rsv On 13%
12| Ready 128.0 C [...|.....] 126.3 C
13| All Enables
14| All Setpoints
To change heater enable / setpoint, select by number: (Alt-x to exit)
Running Display All Temperatures
RUNNING 68K OK

NOTE: For accurate thermal regulation and measurement, the printer covers should be in place.

Fault History

The Fault History displays faults as error codes, stored in the printer's NVRAM, and the copy count when the fault occurred. Type y to clear the history log.


MS-DOS Prompt - DIAGS_UI
Tests Run Next Stop File Options Help
Select Tests to Run
Suite #Sel.
A System Verification 0
B NVRAM / PE ROM 0
C Sensors / Actuators 0
D Thermals 0
E Head Tilt Axis 0
F X Axis 0
G Y Axis 0
H Drum Maintenance 0
I Transfix Roller 0
J Cap 0
K Paper Path 0
L Ink Melt 0
M Head Maintenance 0
N Test Print 0
O Front Panel 0
P Printer Reset 0
Q Printhead Adjust 0
R Convert Fault Codes 1
Individual Test Status
A Access Fault History Records --
B Access Extended Fault History Records --
C Display NVRAM Read Only Data --
D Access NVRAM Read/Write Data --
E Display Print Engine ROM Version Data --
F Display Print Head Version Data --
G Reset PE NVRAM to Defaults --
H Clear PS NVRAM --
I Read DM NVRAM To File --
J Read System NVRAM To File --

Saving And Restoring Test Selections

The current test selection may be saved to a file and later restored, including the completion status of tests which were run earlier. The result of loading a saved test selection file is exactly the same as if the settings were re-specified manually. It provides a way to pre-select tests for particular audiences.

Tests are executed in the order they appear in the menu, not in the order they are selected.

The default file name extensions for saved test selections is **.TSV**.

The **diags.ini** file keeps the settings for the port number, baud rate, whether the debug messages are on or off, and the saved file name.

Definitions:

port: 0	comm port 1
port: 1	comm port 2

baud: 0	9,600 bps
baud: 1	19,200 bps
baud: 2	38,400 bps
baud: 3	57,600 bps

debug: 0	Debug Messages off
debug: 1	Debug Messages on

save: {blank}	no file available
save: {filename.extension}	name of file

Saving And Restoring Other Settings

Any user-configurable setting that the program recognizes is saved in a configuration file called **DIAGS.INI** and persists from session to session. Presently there is a short list of configurable items, but any program setting you make need only be done once.

Diagnostic Pull-down Menus Summary

All of the functionality in the user interface is accessible from the menu bar. Some of the functions are additionally available via “accelerator” key (**Alt**- key) synonyms. The following discusses the pull-down menu left to right.

Tests Command (Alt-T)

Opens the “Tests” selection window.

View Menu

Provides for changing various screens and major modes of operation for the program.

- **Tests** – Switches to the 68K window to show results of test running on the print engine.
- **Erase Screen** – Erases all the characters from the currently selected window; it has no affect on the test running.
- **Debug Check List Item** – Enables or disables a trace of all I/O between the user interface and the printer; it is off by default.
- **Test Stats** – Lists the status of the last test sequence to run

Run Command

Executes a test sequence.

Next Command

Stops the currently running test and immediately starts the next test.

Stop Command

Stops the currently running test and stops the sequence in progress.

File Menu (Alt-F)

This menu controls the saving and loading of test selection sequences, described above.

- **New** – Creates a new test selection sequence (deselects all tests and erases their previous completion codes).
- **Open** – Opens an existing, previously saved file.
- **Save** – Saves the current test selections in the “current” file. If the selection sequences is new (never been saved) the user is prompted to specify a file name.
- **save As** – Saves the current test selections in a particular file.
- **eXit** (**Alt-X**) – Exits the diagnostic program.

Options Menu

Provides for customizing of program operation. Submenus include:

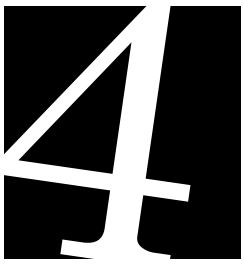
- **CommPort** – Provides for changing the baud rate of the link and for changing the communication port used. The default baud rate is 19.2K. Some diagnostic hosts support rates up to 57K. Whenever the printer is reset or power-cycled, it resets its serial port to 19.2K.

Help Menu

The system includes limited on-line help. The most useful help pertains to the tests themselves and is available via the **Tests** menu.

- **About** – Gives the program version and other statistics about its operation.
- **Usage overview** – Gives the user an overview of the system and explains running the first test.
- **F1** – Describes an individually highlighted test.

Chapter



Chapter 4

Adjustments and Calibrations

Bypass Mode (manufacturing mode) 4-3
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- Exit Roller Drive Belt Tension Adjustment 4-x
- Y-axis Belts Tension Adjustment 4-x
- Printhead-to-Drum Spacing Adjustment 4-x
- Cap/Wipe/Purge Assembly Belt Adjustments 4-x
- Drum Position Encoder Gap 4-x
- Transfix Roller Pressure Spring Adjustment 4-x
- X-axis Scale Adjustment 4-x
- Adjusting Look-Up Tables 4-x
- Setting Interpolation Defaults 4-x
- Measuring Dmax and Dmin 4-x

Vacuum Check 4-x
Resetting NVRAM 4-x
Enabling Ethertalk 4-x
Adding Windows NT Drivers 4-x
Configuring Solaris Workstation 4-x
Configiure FTP Settings 4-x
View and Configure Syslog Settings 4-x
Calibration 4-x

Front Panel Menu

The print engine features an interactive menu that allows you to review or change the printer's stored parameters, as well as initiate test prints and printer service routines. A map of the front panel menu is shown in Figure 4-1.

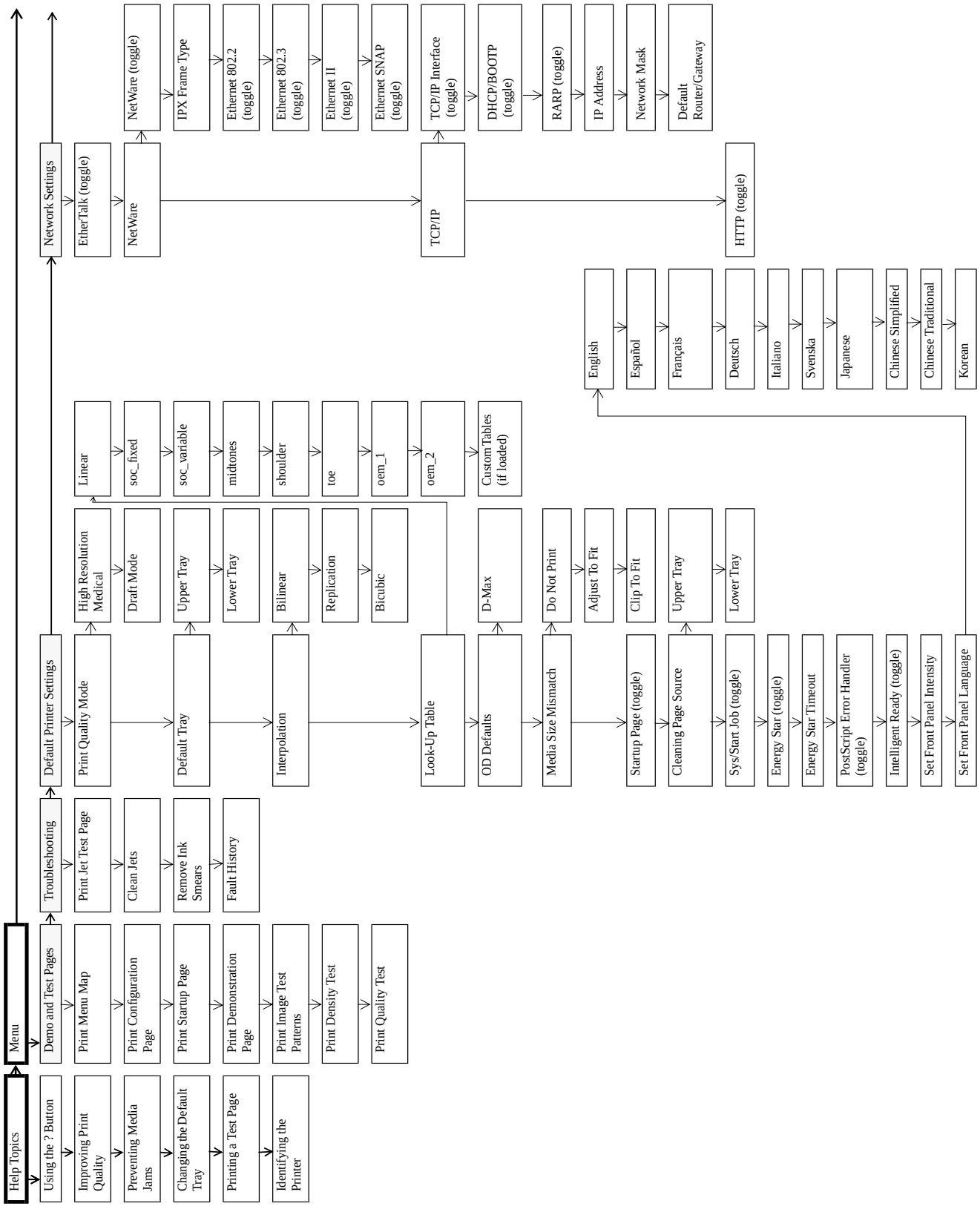
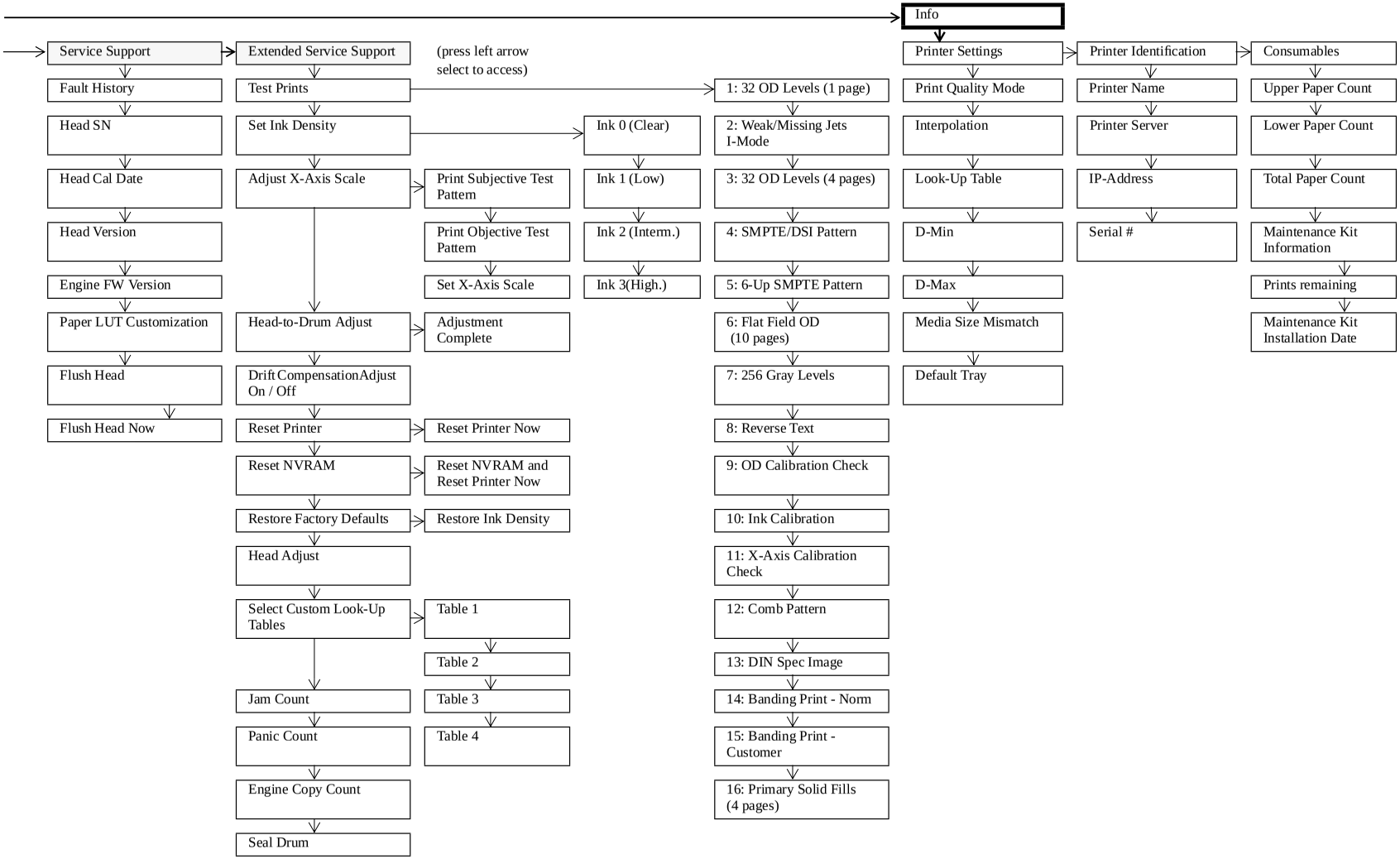


Figure 4-1. Front Panel Menu Map


Info
Service Support
Extended Service Support
(press left arrow select to access)
Printer Settings
Printer Identification
Consumables
Fault History
Test Prints
1: 32 OD Levels (1 page)
Print Quality Mode
Printer Name
Upper Paper Count
Head SN
Set Ink Density
Ink 0 (Clear)
2: Weak/Missing Jets I-Mode
Interpolation
Printer Server
Lower Paper Count
Head Cal Date
Adjust X-Axis Scale
Print Subjective Test Pattern
Ink 1 (Low)
3: 32 OD Levels (4 pages)
Look-Up Table
IP-Address
Total Paper Count
Head Version
Print Objective Test Pattern
Ink 2 (Interm.)
4: SMPTE/DSI Pattern
D-Min
Serial #
Maintenance Kit Information
Engine FW Version
Set X-Axis Scale
Ink 3(High.)
5: 6-Up SMPTE Pattern
D-Max
Prints remaining
Paper LUT Customization
Head-to-Drum Adjust
Adjustment Complete
6: Flat Field OD (10 pages)
Media Size Mismatch
Maintenance Kit Installation Date
Flush Head
Drift Compensation Adjust On / Off
7: 256 Gray Levels
Default Tray
Flush Head Now
Reset Printer
Reset Printer Now
8: Reverse Text
Reset NVRAM
Reset NVRAM and Reset Printer Now
9: OD Calibration Check
Restore Factory Defaults
Restore Ink Density
10: Ink Calibration
Head Adjust
11: X-Axis Calibration Check
Select Custom Look-Up Tables
Table 1
12: Comb Pattern
Table 2
13: DIN Spec Image
Jam Count
Table 3
14: Banding Print - Norm
Panic Count
Table 4
15: Banding Print - Customer
Engine Copy Count
16: Primary Solid Fills (4 pages)
Seal Drum

Hidden Service Menu

To access the hidden service menu:

1. Scroll to the **Service Support** menu and press the **Select** button.
2. Press and hold the **Left arrow** button.
3. While holding the **Left arrow button**; press the **Select** button.

Service Support Menu

Previous Menu
Test Prints
Set Ink Density
Adjust X-Axis Scale
Head-to-Drum Adjust
Drift Compensation (On/Off)
Reset Printer
Reset NVRAM
Restore Factory Defaults
Head Adjust
Select Custom Look-Up Tables
Jam Count: #
Panic Count: #
Engine Copy Count: #
Seal/Drum
Exit

Printing Service Test Prints

1. Turn on the printer.
2. Allow the printer to complete its power-up self-tests. The front panel displays:

   `READY TO PRINT`

3. Scroll to the **Service Support** menu and press the **Select** button.
4. Press and hold the **Left arrow** button.
5. While holding the **Left arrow** button, press the **Select** button to enter the hidden Service menu.
6. Scroll to the menu item **Test Prints** and press the **Select** button.
7. Select a test print by scrolling to a print and pressing the **Select** button.

Refer to Appendix B, “Test Prints.” It discusses each test print and what printing defect it reveals.

Process Belt Tension Adjustment

1. Turn off the printer and remove the left-side cabinet panel.
2. To adjust the belt tension, loosen the process belt tensioner. With a spring scale, press inward on the tension idler of the process belt with a pressure of 0.7 kg, ±14 g (24 oz., ±0.5 oz.) and then tighten the tensioner in place. Do not over-tension the belt.

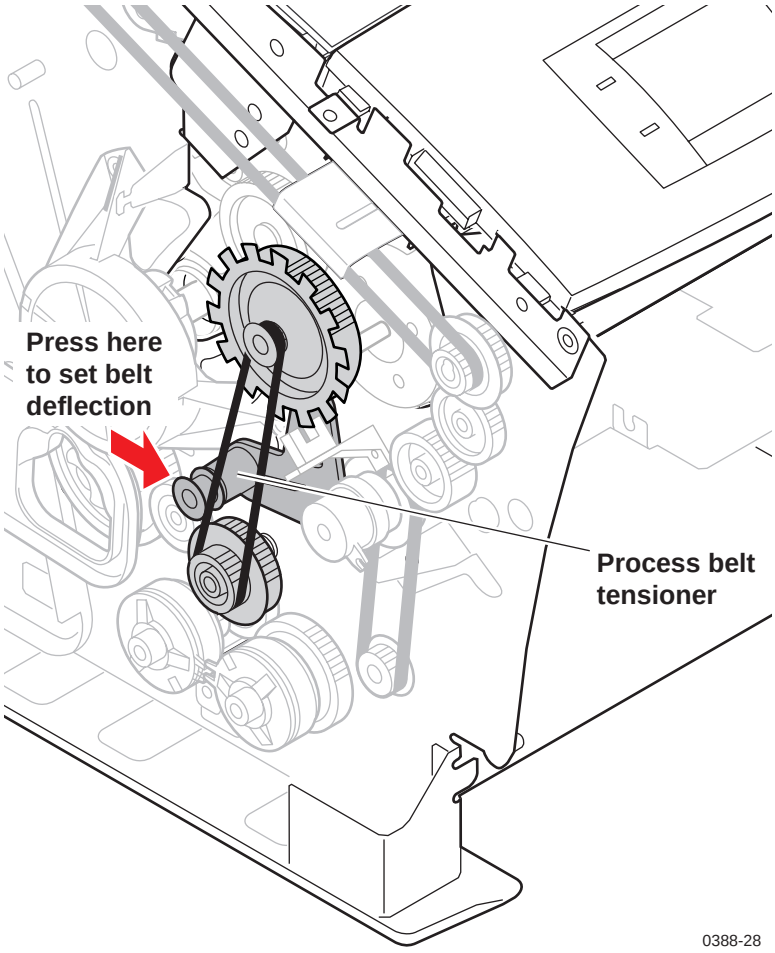


Figure 4-2. Setting Process Belt Tension

3. Reinstall the left side panel.

Exit Roller Drive Belt Tension Adjustment

1. Turn off the printer and remove the left-side cabinet panel.
2. To adjust the belt tension, loosen the exit roller drive belt tensioner. With a spring scale, press downward on the idler tensioner of the exit roller drive belt with a pressure of 0.34 kg, ±14 g (12 oz., ±0.5 oz.) then tighten the tensioner in place. Do not over-tension the belt.

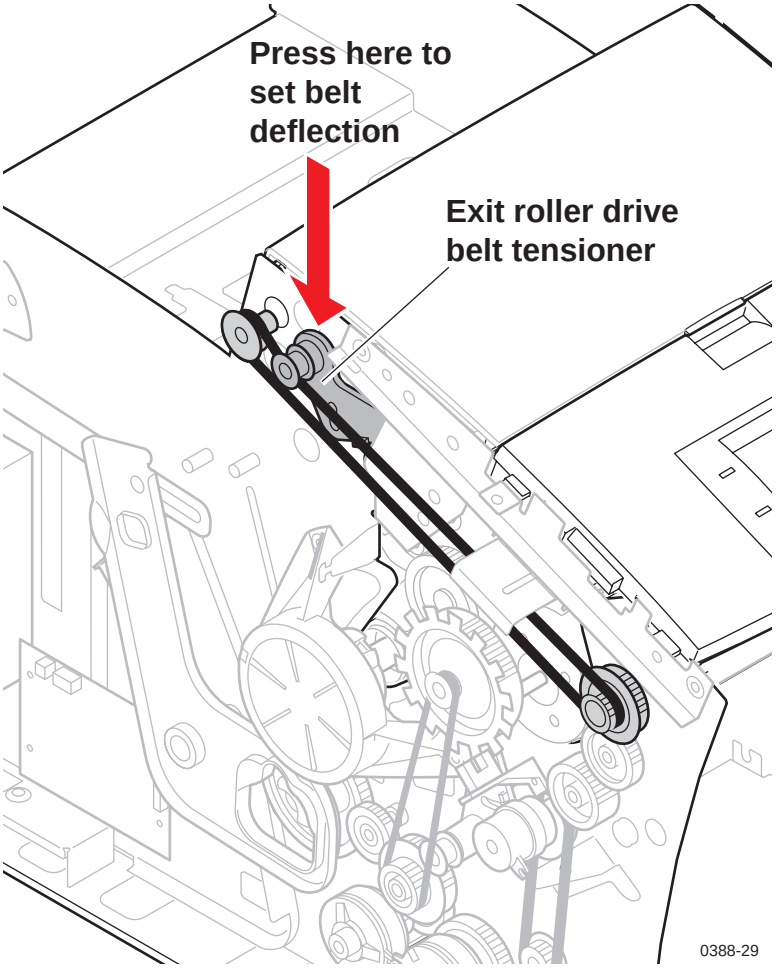


Figure 4-3. Setting Exit Roller Drive Belt Tension

3. Reinstall the left side panel.

Y-axis Belts Tension Adjustment

Perform this procedure after loosening or removing the Y-axis belt drive assembly. (Refer to Figure 4-4.)

1. Ensure that the three mounting screws that secure the Y-axis drive assembly to the chassis are one turn loose and that the Y-axis idler bracket slides freely with respect to the chassis.

NOTE: If there is a situation in which diagnostics are not available when installing a new Y-axis drive assembly or drum/transfix assembly, then locate any previously placed index marks on the pulleys and proceed as if re-using existing parts. Allow the system to cool as long as feasible before mounting the Y-axis drive assembly onto the chassis. Tensioning of the Y-axis drive assembly without diagnostics increases the risk of failures associated with low belt tension (for example, a "growling" sound heard upon cold power-ups).

2. Attach the Y-axis belt tension tool (in its unloaded or folded out position) to the keyholes in the side frame of the printer just below and in front of the Y-axis drive assembly. The tool's fishhook should engage the eyelet of the Y-axis drive assembly.
3. Pull forward and down on the lever arm of the tension tool to apply tension to the Y-axis belts.
4. While the belts are under tension, rotate the drum pulley five times to rotate the belts and seat them in place.
5. Beginning with the upper-right screw, tighten the three mounting screws to 30 in.-lbs. to secure the Y-axis drive assembly in place.
6. Using PC-based diagnostics, run the test: "Position for Belt Tightening" in the "Y-Axis Group" test suite. This positions the belts in the proper orientation for retensioning. Do not move the pulleys.
7. Place an index mark on the edge of each pulley: Mark the Y-axis drive pulley and the drum pulley where the edges are closest to one another, disregarding previous marks. Use a distinct color if the pulleys have been previously marked.
8. Loosen the 3 mounting screws until the bracket slides freely on the chassis and then re-tighten the screws to 30 in.-lb.
9. Release the tension tool's lever arm and remove the tool.
10. Reassemble the printer and make a test print.

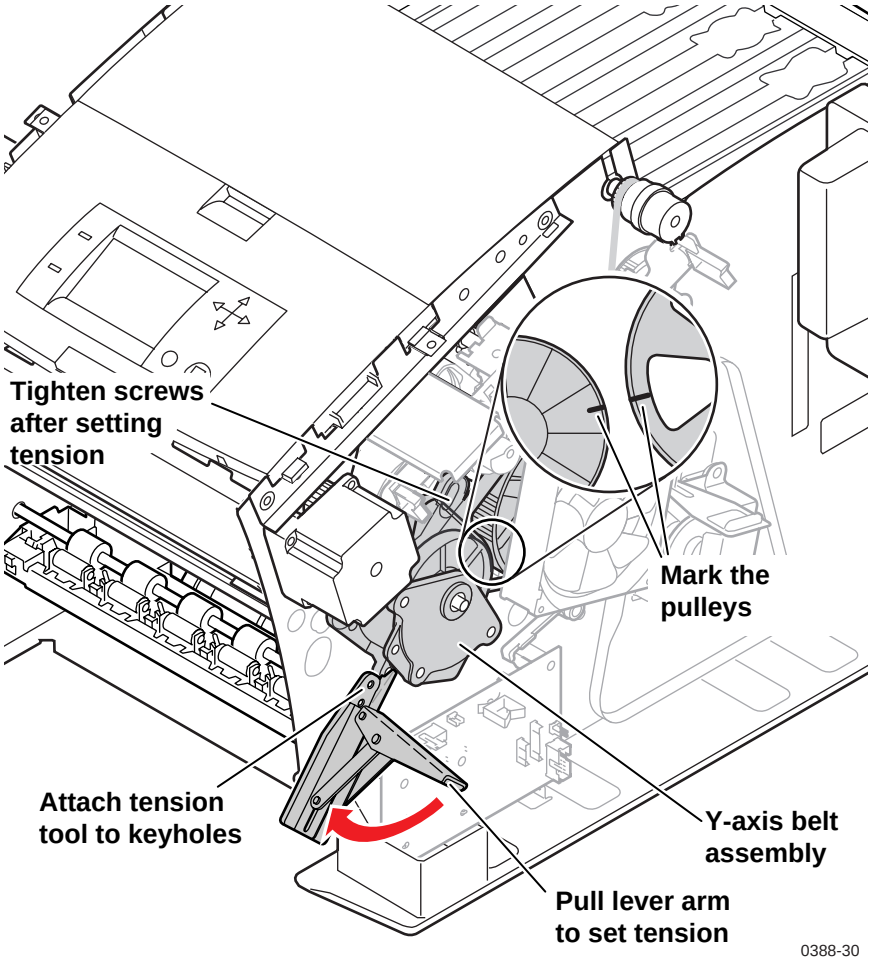


Figure 4-4. Setting the Y-axis Belt Tension

Cold Printhead-to-Drum Spacing Adjustment

Tools required:

- Printhead-to-Drum Digital Indicator Gauge Kit
- Small (3/16 in.) flat-blade screwdriver
- 9/64 in. hex tip
- Magnetic screwdriver
- T-20 TORX tip
- Torque Limiting Screwdriver
- Computer running PC-based service diagnostics

CAUTION

To prevent damage to the printer, remove the printhead tilt arm spring before moving the X-axis to tilt the printhead. If the spring is attached when moving the X-axis, the printhead may tilt rapidly and impact the drum

CAUTION

To avoid damage to the printhead, never touch the faceplate with your hands or any foreign object including tools and media.

Even if the printhead is cold, use the printhead removal tool and printhead reservoir removal procedure.

Place the removed printhead on a clean, level surface.

During this section of the worksheet, you will perform a mechanical adjustment of the printhead to establish the spacing between the printhead faceplate and print drum. For best print quality, the spacing should be equal on the left and right sides of the printhead. The adjustment is made when the printhead is cold. After the printer warms up the spacing is then checked to ensure it is within tolerance.

1. Remove the right cover and the left cover.
2. Remove the top cover.

3. Remove the ink loader and the metal heat cover.
4. Tilt the printhead to its print position and, if removed, attach the head tilt spring.
5. Torque the mounting screws to 20 in/lbs.
6. Install the digital gap indicator and bracket to the left side of the printer frame and tilt arm as described in the Procedure "Mounting the Digital Indicator Gauge". Ensure the digital indicator is set to inches, "in."

NOTE: Always move the printhead by moving the tilt arm.

---

7. At the left side of the printhead, insert the left printhead spacer between the printhead and the drum. Check the indicator, it should read 0.0030 + / - 0.0010 inches. Adjust the printhead's spacing adjustment by twisting a flat-blade screwdriver in the adjustment slot to move the printhead's position until the indicator reads the correct value.

NOTE: Do not insert both spacers at the same time as this will only measure the larger of the two gaps.

---

8. Remove the left printhead spacer and install the right spacer between the printhead and the drum. Repeat the adjustment. Confirm the left side is still in adjustment. If not, alternate between the two sides until both sides read 0.0030 ±0.0010 inches.
9. Remove the spacers. Snug the four locking screws using an X pattern.Then tighten the four screws, using the same X pattern, to 20 in.-lbs.
10. Plug the printhead's data ribbon cable and power wiring harness into the power control board and the printhead. Inspect both ends of the data ribbon cable to ensure they are properly seated. Reconnect the two printhead ground wires to the printer frame.
11. Perform the "Hot Printhead-to-Drum Spacing Adjustment" to set the correct gap between the "hot" printhead and the drum.

Hot Printhead-To-Drum Spacing Adjustment

Tools required:

- Printhead-to-Drum Digital Indicator Gauge Kit
- Small (3/16 in.) flat-blade screwdriver
- 9/64 in. hex tip
- Magnetic screwdriver
- T-20 TORX tip
- Torque Limiting Screwdriver
- Computer running PC-based service diagnostics

This procedure assures that the printhead is the proper distance from the drum. Make this adjustment after removing or replacing the printhead and performing a cold adjustment or when the head has not been installed, but requires a minor adjustment.

1. Remove the right cover and the left cover.
2. Remove the top cover.
3. Remove the ink loader and the metal heat cover.
4. Tilt the printhead to its print position and, if removed, attach the head tilt spring.

CAUTION

The head tilt cam gear must be completely disengaged from the drive gear. If not, the printhead-to-drum gap may be too small, allowing the printhead faceplate to come in contact with the drum.

5. Place the printer in diagnostic mode by setting dip switch 1 in the down position.
6. Prepare your laptop computer for running diagnostics and connect the diagnostics cable to the printer.
7. Turn on the printer.
8. In your PC- based diagnostics, scroll to the “Printhead Adjust” test suite and run the “Do Printhead-to-Drum Gap Adjustment (Hot)” routine. The routine automatically centers the printhead, and brings the printhead and drum to their operating temperatures.
9. If they are not already tightened, tighten the printhead mounting screws to 20 in- lbs.
10. If they are not already loose, loosen the printhead’s four locking screws (two at each end of the printhead) until they are just

snug in place.

11. Install the digital gap indicator and bracket to the left side of the printer frame and tilt arm as described in the Procedure "Mounting the Digital Indicator Gauge". Ensure the digital indicator is set to inches, "in."

NOTE: Always move the printhead by moving the tilt arm.

---

12. At the right side of the printhead, insert the right printhead spacer between the printhead and the drum. Check the indicator it should read 0.0070 ±0.0010 inches. Adjust the printhead's spacing adjustment by twisting a flat-blade screwdriver in the adjustment slot to move the printhead's position until the indicator reads the correct value.

NOTE: Do not insert both spacers at the same time as this will only measure the larger of the two gaps.

---

13. Remove the right printhead spacer and install the left spacer between the printhead and drum. Repeat the adjustment. Confirm the right side is still in adjustment. If not, alternate between the two sides until both sides read 0.0070 ±0.0010 inches.

14. Remove the spacer. Snug the four locking screws using an X pattern. Then tighten the four screws, using the same X pattern, to 20 in.-lbs.

15. If not connected, plug the printhead's data ribbon cable and power wiring harness into the power control board. Inspect both ends of the data ribbon cable to ensure they are properly seated.

16. Recheck the gap at both ends of the printhead.

17. Remove the digital indicator gauge and bracket from the frame.

18. Reinstall the ink loader and metal heat cover.

19. Terminate the PC-based diagnostics and disconnect the laptop.
20. Reinstall the top cover.
21. Print Service Test Print 12: Comb Pattern to check alignment.

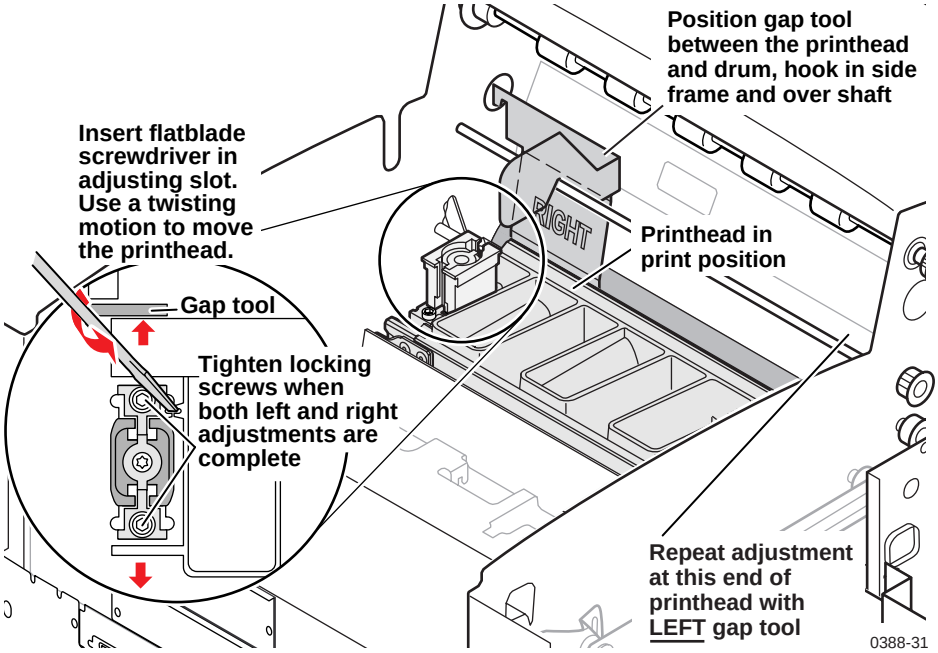

Position gap tool between the printhead and drum, hook in side frame and over shaft
Insert flatblade screwdriver in adjusting slot. Use a twisting motion to move the printhead.
RIGHT
Printhead in print position
Gap tool
Tighten locking screws when both left and right adjustments are complete
Repeat adjustment at this end of printhead with LEFT gap tool
0388-31

Figure 4-5. Setting the Head to Drum Gap Adjustment

CAUTION

When powering up after installing a new printhead, reset the "Head Adjust in the hidden Service menu to "128". If this step is forgotten, the jets may eject too much ink on the page, causing one or more of the following:

- **shifting or displacement of ink during transfix**
- **wrinkling**
- **jet "drop out"causing random weak vertical streaks in solid fills. It may take multiple solid fills for this effect to**

occur.

NOTE: Some service actions could leave the tilt arm in the wrong location to allow a normal power up. This is especially true in replacing the Printhead. When this happens, unusual noise and a loud slam may occur after which the tilt system will recover properly. This happens as the tilt arm struggles past the ship restrain tab. A quick power down and power up will verify normal operation has been resumed. To prevent the slam condition, position the head near the center of the X-axis travel before turning on the printer.

Mounting the Digital Indicator Gauge

Mount the Digital Indicator Gauge

The digital indicator gauge must be mounted properly to obtain stable printhead-to drum spacing readings. Use the mounting holes, post and screw provided on the chassis when mounting the gauge. Refer to Figure 4-6 to mount the gauge.

When installing the digital indicator gauge, push forward on the gauge's mounting bracket so it is tight against the hex screw and the upper screw in the chassis, and then tighten the upper chassis screw. The gauge brack must be tight against the mounting post.

While installing the tilt arm bracket, push forward on the bracket so

it is flush with the head tilt arm, and then tighten the two screws. The bracket must be flush with the tilt arm.

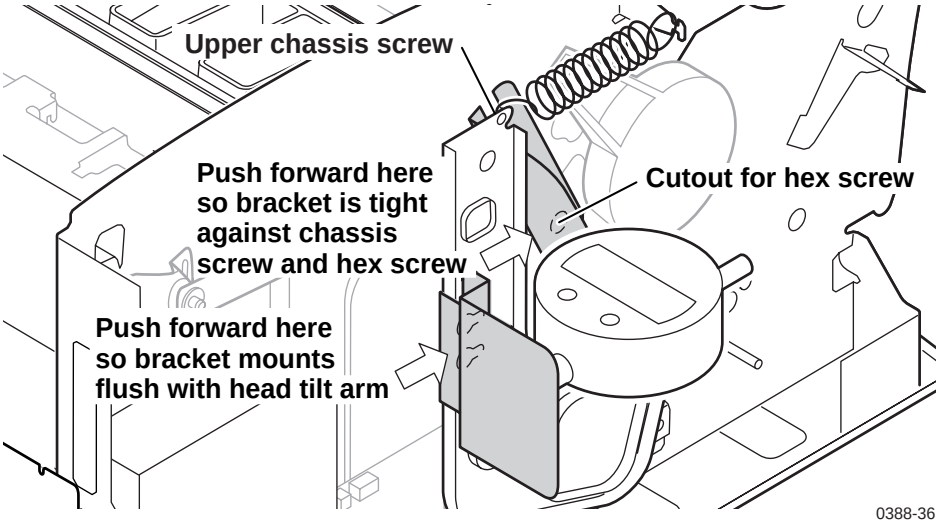

Upper chassis screw
Push forward here so bracket is tight against chassis screw and hex screw
Cutout for hex screw
Push forward here so bracket mounts flush with head tilt arm
0388-36

Figure 4-6. Mounting the Digital Indicator Gauge.

Zero the Digital Indicator Gauge

If the digital indicator gauge is not zeroed properly, it will produce unstable readings. To zero the gauge:

1. Place your thumb on the gray Origin button.
2. Place your index finger underneath the gauge.
3. Press and hold the Origin button until the gauge zeroes, being careful to support the gauge with your index finger.
4. To test the stability, move the head tilt arm back and then forward several times. The gauge should return to zero each time the head tilt arm is moved forward. Do not move the tilt arm by the bracket mounted on it. This will cause the arm to flex and your readings will vary.

Install the Gap Tools

The left and right gap tools must be installed properly to correctly adjust the printhead-to-drum spacing. To install the tools (refer to Figure 4-7):

1. Postition the tip of the gap tool between the printhead and the drum.
2. Hook one side of the tool through the hole in the chassis.
3. Hook the other side of the tool over the chrome shaft above the printhead.

NOTE: The left and right gap tools should never be interchanged because they are different thicknesses.

To properly adjust the printhead-to-drum gap, use only one gap tool at a time.

To prevent the printhead adjustment from changing, remove the gap tool when torquing the printhead screws.

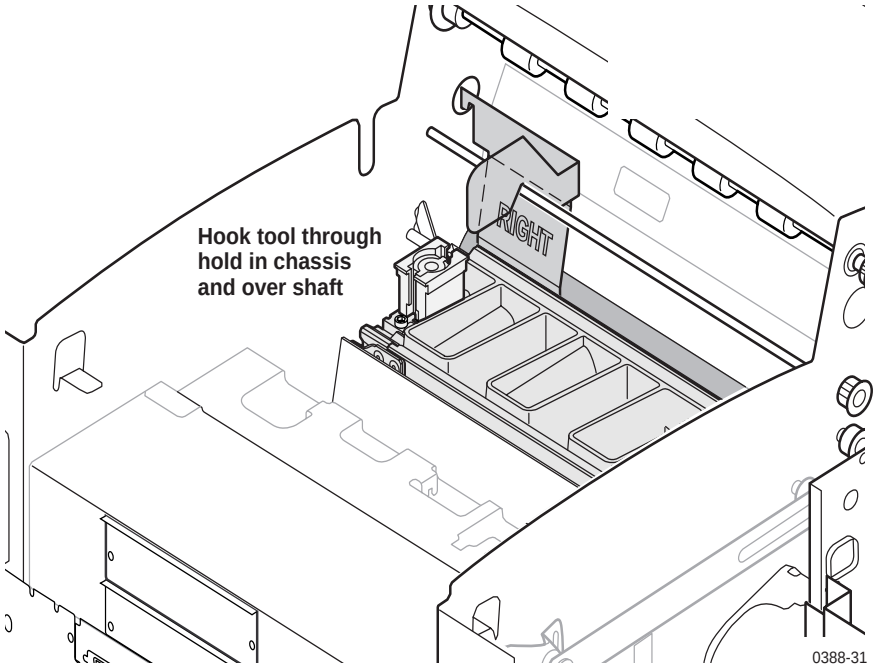


Figure 4-7. Installing the Gap ToolCap/Wipe/Purge Assembly Belt Adjustments

The tension of the cap/wipe/purge assembly belts is factory-set. Do not adjust them unless you remove or replace one or both belts. The belts are Kevlar-reinforced; they will not stretch over their lifetime. The belts are also factory-adjusted for parallel tracking (alignment).

As long as the belts, cap/wipe/purge assembly motor, and the belt clips (which hold the cap/wipe/purge assembly) are not disturbed, no adjustment is needed.

However, if you replace one or both of the belts or the cap/wipe/purge drive motor, you must ensure that the belts are in alignment (timing) with each other; this ensures that the cap/wipe/purge assembly is perfectly aligned to the faceplate of the printhead. If the belts are not aligned, the printhead purging is ineffective, due to poor sealing between the printhead faceplate and the cap/wipe/purge assembly.

1. Ensure that the cap/wipe/purge assembly is properly installed. Also ensure that the cap/wipe/purge drive motor is installed in place and that both the left- and right-side drive belt locks are assembled correctly.

2. Rotate the large drive gear to pull the cap/wipe/purge assembly to about the middle of its travel in the chassis frame slot.

3. Ensure each drive belt lock is tightened to its fourth tooth, as illustrated in Figure 4-7.

4. Position the left-side drive belt lock so its pointer points between the index mark on the printer frame.

5. Holding the left belt so it does not move, inspect the right-side drive belt lock's pointer. It should point at the index marks on the right-side printer frame.

   If the right-side pointer does not point to the index mark while the left-side belt lock is between its marks, loosen the right drive belt by removing the lower idler pulley and adjusting the belt so that it aligns with the timing mark.

6. Repeat until the right-side belt lock's pointer points at the index mark on the right-side frame as the left-side belt lock's pointer points between its index marks on the left-side frame.

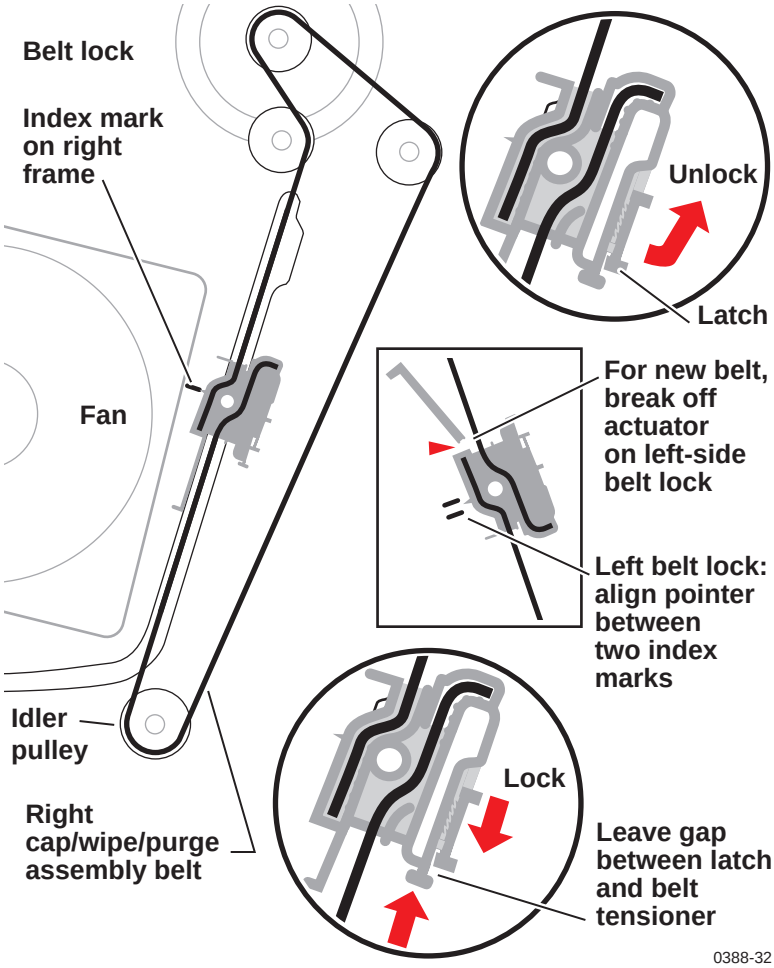


Figure 4-8. Aligning (Timing) The Cap/Wipe/Purge Assembly Drive Belts

Drum Position Encoder Gap

This procedure ensures that the drum-position sensor assembly's encoder wheel rotates freely inside the gap of the drum-position sensor without the encoder wheel's disk touching the sensor. If the disk touches the sensor, it can abrade the disk and result in erroneous drum position readings.

1. Ensure that the retaining spring is not in the drum-position

sensor assembly's encoder wheel groove. This ensures that the encoder wheel is not tensioned and slides easily onto the drum shaft.

2. If not already mounted in place, secure the drum-position sensor assembly onto the drum shaft and secure it to the printer frame.

3. Through the access hole in the drum-position sensor assembly, position the encoder gap tool on the drum shaft, maintaining a position perpendicular to the shaft.

4. Reposition the drum-position sensor assembly's encoder wheel on the drum shaft until it butts firmly against the encoder gap tool.

5. Holding the gap tool in place, with a small, flatblade screwdriver, slide the encoder wheel's retaining spring into the encoder wheel's groove.

6. Remove the gap tool. Reassemble the printer and make a test print.

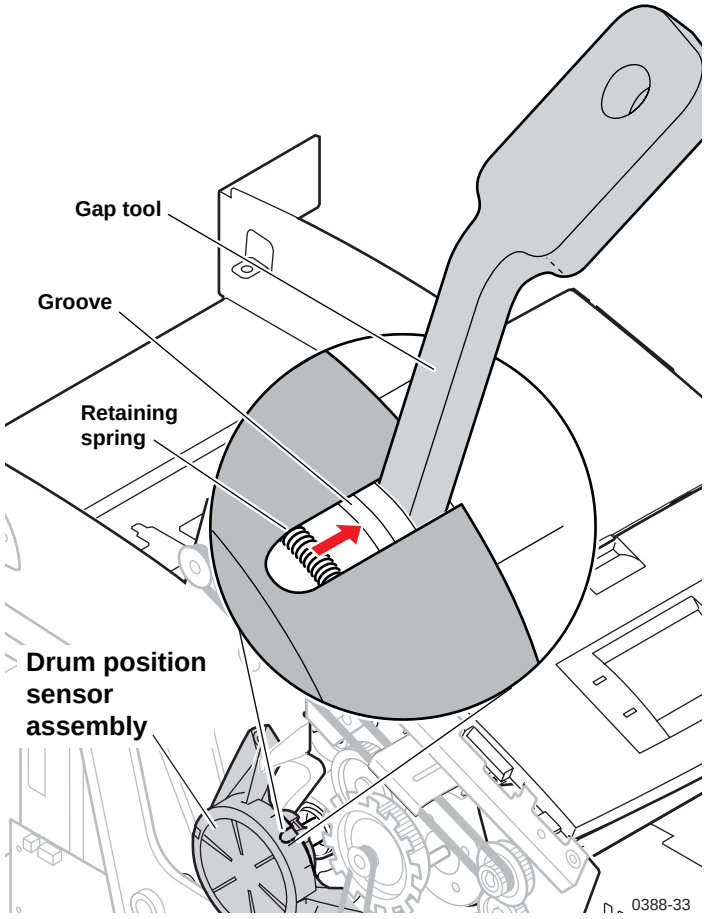


Figure 4-9. Setting The Drum Position Encoder Gap

Transfix Roller Pressure Spring Adjustment

1. Print the Service Test Print 16: Primary Solid Fills (4 pages).
2. If any of the prints are wrinkled on both the left and right sides of the print, the drum/transfix assembly must be replaced. No adjustment will solve the problem.
3. If wrinkling is only present on the left or right side of any print, note which side.
4. Remove the front cover to access the drum/transfix assembly.
5. Draw a reference mark on the both the left and right spring set screws.

6. On the side of the printer corresponding to the wrinkling, tighten the set screw clockwise 1/8 of a revolution, using a 4 mm hex driver. On the side that does not wrinkle, loosen its set screw 1/8 of a revolution.

NOTE: Whatever adjustment is added to one side must be taken away from the other side to maintain roller balance.)

---

7. Reassemble the printer and again print the Service Test Print 16: Primary Solid Fills.

8. If wrinkling still occurs on the same side, repeat Step 6 and 7.

CAUTION

Do not adjust the set screws more than 3/8 of a revolution from their original position. Any adjustment beyond this point results in ink adhesion problems.

---

9. If wrinkling continues to occur, replace the drum/transfix assembly.

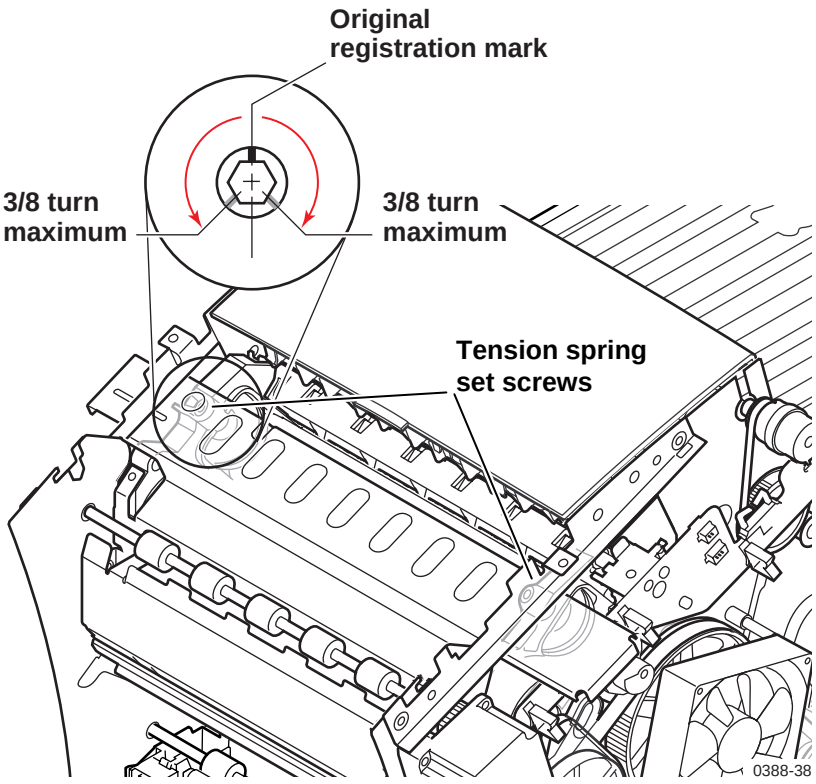


Figure 4-10. Adjusting The Transfix Roller Pressure Springs

X-axis Scale Adjustment

This adjustment sets the gain or rate-of travel of the printhead's X-axis movement.

1. Allow the printer to warm up to its idle, "Ready to Print," state.
2. Enter the "hidden" service menu by scrolling to the **Service Support** menu and pressing the **Select** button. Then press and hold the **Left arrow** button and, while holding the **Left arrow** button, press the **Select** button.
3. Scroll to the menu item **Adjust X-Axis Scale** and press the **Select** button. Scroll to the menu item **Print Subjective Test Pattern** and press the **Select** button.
4. The print features four gray columns, each containing a jagged black band. The black bands should all align vertically with each other.
5. If an adjustment is needed, scroll to the menu item **Set X-Axis Scale**. Change the displayed value to a new value, if necessary. Increasing the scale value raises the two center black bars. Decreasing the scale value lowers the two center black bars.
6. Select the menu item **Print Subjective Test** pattern to verify the adjustment. Repeat the adjustment, if necessary.

   Try to align the two center black bands and the two outer black bands within one tick mark on the vertical scale.

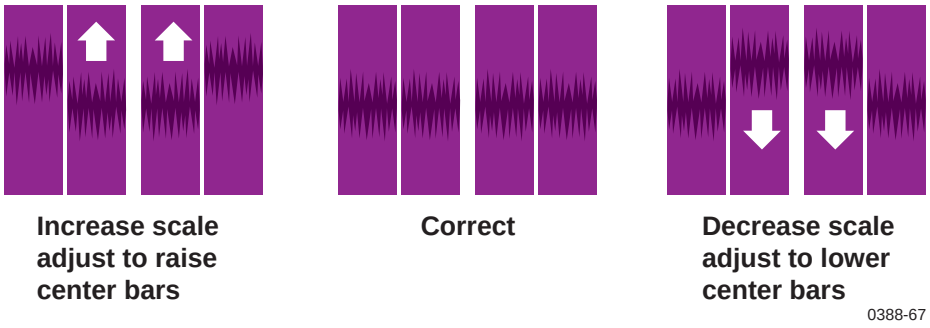


Figure 4-11. Adjusting the X-axis Scale Adjustment

NOTE: The X-Axis Scale Adjustment menu also includes the item for printing the Objective Test pattern. This pattern is only useful at the factory. The Subjective Test pattern should be used instead.

Adjusting Look-Up Tables

The Look-Up Table (LUT) menu displays all of the LUT resources currently available in the printer. The default LUT is indicated with a check mark. The list of available LUTS is in alphabetic order. If there are Contrast values within a family, the menu button is labeled contrast. If there is not a contrast, the menu selection is limited to OK. The standard family/contrast values is displayed in Table 4-1. There may be up to 4 Custom LUT also stored in the Hidden Service Menu.

Table 4-1. Look-Up Tables

Family	Contrasts Available
Linear	1
soc-fixed	12
soc-variable	15
midtones	10
shoulder	5
toe	10
oem_1	12
oem_2	2

Custom Look-Up Tables

1. Cycle through up to 4 of the downloaded LUT. The tables appear as a choice to save if the name is 16 characters or less, the Transfer Table type is 3 or 4 and there are 6 coefficients or less. Selecting the user tables and selecting **OK** saves it in NVRAM.

NOTE: The message that the table has been saved is displayed for 2 seconds.

```
name of custom table
Saved as Table 1
```

2. If this table had been previously saved, you must confirm to replace the table selection.

```
Replace Current Table 1
name of custom table?  OK
```

If there have not been any custom tables downloaded to the printer, when the menu button is pressed the front panel displays

```
No Custom Look-Up Table Are Available.
```

Paper LUT

The menu item Paper LUT Customization is found under the menu Service Support. The Paper LUT Customization setting is a number ranging from 0.5 to 1.0. It affects how built-in look-up tables appear on paper. (User-defined LUT families and the Linear LUT are not affected.) Lower values whiten images, while higher values darken images.

NOTE: The default setting is 0.8. Adjusting this value is not recommended.

Setting Interpolation Defaults

This option lets you change the default image interpolation mode.

Since image resolution is usually 150 to 300 dpi, and the printer produces images at 600 dpi, most images are automatically expanded or scaled when printed. Use this option to specify the way your images are smoothed or blended when they are scaled.

Bilinear

This selection blends adjacent pixels in an image in a manner that is linear in both the horizontal and vertical axes of the image. Bilinear is the most common, and the fastest, image smoothing method.

Cubic

These selections are slower methods of image smoothing that produce sharper image detail. The values represent degrees of sharpness, with the smaller values producing the sharpest image detail.

Replication

This selection uses a technique that expands with each pixel. Use Replication for an accurate representation of image data, with no smoothing modifications.

Setting Dmin and Dmax

Adjustments can be made to the Dmin and Dmax settings in the driver software of the workstation you are sending the data from. Any settings sent by the drivers will overwrite the default settings on the printer for that job.

Adjusting Dmin will set the lower limit for optical density that the printer will produce. The Dmin default will be equal to the Ink 0 setting. It is not accessible from the front panel menu.

Adjusting Dmax will set the upper limit for optical density that the printer will produce. It is accessible through the **Default Printer Settings** menu under **OD Defaults**.

Table 4-2. Ink Settings

Service Test Print 10/ Front Panel Designation	Name of Ink Color	Number on Ink Stick	Default	Expected Range
Ink 0	Clear	11	0.09	0.03 to 0.10
Ink 1	Low	12	0.89	0.60 to 0.90
Ink 2	Intermediate	13	1.89	1.50 to 2.00
Ink 3	High	14	3.54	3.00 to 3.70

NOTE: OD measurements are based on the use of a reflective densitometer with polarization filter. Approved models are Gretag D19C (filter type 47B/P) and X-Rite 400B.

Optical Density Calibration (Setting Ink Densities)

Optical Density should be performed (or at least checked) on a yearly basis. Performing optical density calibration involves measuring the density values for the primary inks and inputting them in the front panel. Then, a test print is printed and measured to verify calibration.

To calibrate Optical Density:

1. Print Service Test Print 10.
2. Using an approved densitometer, measure all the squares in columns A, C, E, H, K, and L, and calculate the averages for Inks 0–3.
3. Input these values into the front panel through the Hidden Service menu under "**Set Ink Density**." Return to "Ready."

4. Print Service Test Print 9.

5. Measure points P1 through P20, and calculate the averages for the boxes having the four different densities: Low, Medium, High and Super High. The values for these densities must be within the following ranges:

Low	0.13 to 0.17
Medium	0.93 to 1.07
High	1.65 to 1.85
Super High	2.61 to 2.89

If calibration is not achieved, do the following:

- Check that averages were calculated correctly.
- Check that the densitometer is calibrated and is the correct type. It must be a Gretag D19C or X-Rite 400B and must contain a “polarizing” filter.
- Perform the following iteration:

If Super High failed,

a. First, check to make sure that the front panel setting for Dmax is greater than 2.75. If so, proceed to the next step. If not, set Dmax to 3.2, reprint Service Test Print 9 and remeasure.

b. Subtact 2.75 from the actual value measured.

c. Add this value to “Ink 3” and adjust in the Hidden Service Menu.

d. Go to “Ready.” Reprint Service Test Print 9 and remeasure.

If Low Failed,

a. Check that Dmin (Info→Printer Settings→Dmin) is equal to Ink 0. If it is, proceed to Step b. If it is not, adjust Dmin equal to Ink 0. Since Dmin has no direct knob, the way to do this is to adjust Ink 0 down 0.01, return to “Ready,” then adjust Ink 0 back up 0.01. This will cause Dmin to default to whatever Ink 0 is. Proceed to Step c.

b. If Low fails on the high side, add 0.01 to Ink 0. If Low fails on the low side, subtract 0.01 from Ink 0. Adjust Ink 0 in the Hidden Service Menu.

c . Go to “Ready.” Reprint Service Test Print 9 and remeasure.

Vacuum Check

Tools required:

- Magnetic screwdriver
- Vacuum gauge
- T-20 TORX tip
- T-15 TORX tip
- T-connector for vacuum gauge
- PC diagnostics

Use this check to verify the actions of the vacuum pump and the solenoid valve. In addition, you can determine if the cap/wipe/purge assembly is sealing properly against the printhead faceplate.

1. Turn off the printer.
2. Remove the top and right-side covers.
3. With a T-connector, connect the vacuum gauge to the between the vacuum/pump module and the cap/wipe/purge unit.

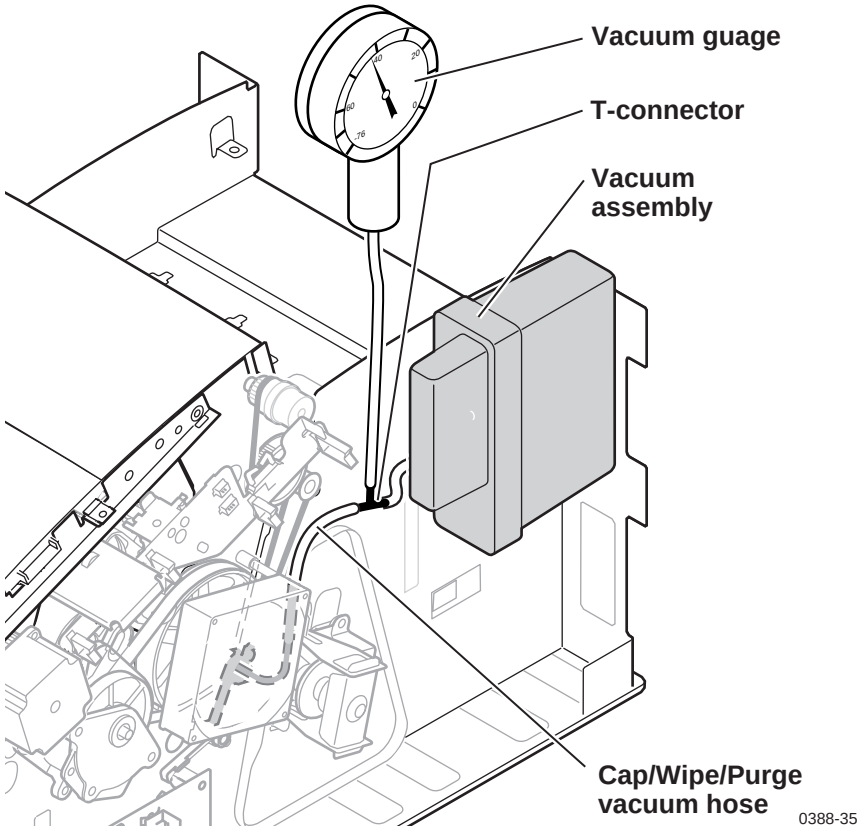


Figure 4-12. Connecting the Vacuum Gauge To The Printer

4. Turn on the printer and enable the PC diagnostics as explained in the topic, “PC-based Diagnostics.”

5. Run the “Purge Printhead test” from the “Head Maintenance” test suite. When the solenoid valve is energized, you should see the vacuum gauge jump to about the value 51 cm Hg (20 in. Hg, 10 psi) and within 4 to 6 seconds bleed off to 0.

   If the vacuum does not reach the expected value:

   - There is a leak in the vacuum system from the pump
   - The accumulator and their plumbing or the vacuum pump is defective

   If the vacuum drops to zero immediately, the cap/wipe/purge unit is not sealed to the printhead.

This test allows you to check the action of the vacuum as it is applied to the printhead; the cap/wipe/purge assembly should be sharply sucked against the printhead faceplate. If it is not, there may be an

ink clog in the vacuum tube leading to the cap/wipe/purge assembly.

If the vacuum does not bleed off, then the air valve is not opening properly, the 7-mil orifice (a part of the vacuum/pump assembly) is blocked or the vacuum tubing may be clogged. If the printhead is hot, such a condition can allow ink to be sucked into the vacuum system tubing. If the vacuum takes longer than 4 to 6 seconds to bleed off, the air valve solenoid or the cap/wipe/purge assembly may be defective.

If the vacuum bleeds off too quickly, the tubing will be blocked or the cap/wipe/purge assembly may be defective; check to see if the cap/wipe/purge assembly is not sealing properly to the faceplate. Check that the cap/wipe/purge assembly is properly positioned by performing the " "Cap/Wipe/Purge Assembly Belt Adjustments."

Resetting NVRAM

Resetting NVRAM returns most the printers's PostScript NVRAM-stored parameters, including those of the network card, to their factory defaults, except the copy count (for images processed through the image processor), the Adobe firmware serial number, the usage profile and the authorization codes. Print engine NVRAM values are not changed by the following procedure.

Select NVRAM parameters are not reset by the standard resets found in the front panel or PC-based diagnostics. These include copy counts, panic counts, ink density calibrations, and boot parameters among others. If particular parameters become corrupt, the printer may not operate correctly or may not recover. If NVRAM corruption of this type occurs, the most effective method of correcting the problem is to replace the offending NVRAM part with a new part.

To reset the printer to its factory-default values, follow this procedure:

1. If possible, print the Configuration Page for a record of all the printer's port settings and other customer-unique settings.
2. Enter the Service Support menu.
3. Press and hold the **Left arrow** button.
4. While holding the **Left arrow** button, press the **Select** button to enter the hidden service menu.
5. Scroll to the menu item **Reset NVRAM** and press the **Select** button.
6. Scroll to the menu item **Reset NVRAM and Reset Printer Now** and press the **Select** button again, to reset NVRAM.

Alternately, you can also use the PC diagnostics to selectively return either the print engine NVRAM contents or the PostScript NVRAM contents to their factory default values as shown in the following illustrations.

Running **Reset PE NVRAM to Default** or **Clear PS NVRAM** downloads a file to the printer that performs the indicated reset function; there is no confirmation or cancel function.

Calibration

X-axis Calibration

The calibration specification is ± 1 count (0.01) at t=0 and ±3 count (0.03) over time. Use the following steps to calibrate the X-axis to within these specifications.

CAUTION

Do not lean on or interrupt the printer while printing the Subjective Test Print.

1. Print the Subjective Test Print.
2. In the hidden Service menu, scroll to the menu item **Adjust X-Axis Scale** and press the **Select** button.
3. Scroll to the menu item **Print Subjective Test Pattern** and press the **Select** button.
4. View the pattern and determine if there is evidence of underscan or overscan. Count the hash marks. Read from the table at the top of the print to determine the next adjusted scale factor.
5. Enter the new scale factor using the Up- and Down-arrow buttons to adjust to the proper value.
6. Print the Subjective Test Print again.
7. Repeat the process, as needed.

Engine Copy Count

The engine copy count maintains the number of pages printed successfully. The total does not include blank cleaning pages nor pages that jam. (The other copy counts, available from the Startup Page, Configuration Page, and front panel menu Info, do include pages that jam.) The engine copy count is not zeroed by a standard NVRAM reset and is left intact by the factory. The engine copy count is displayed following the colon.

The engine copy count is not normally shown as part of the service menu Fault History. However, a special "hidden" fault history menu does display the engine copy count above the fault history list. The special fault history menu can be displayed while the printer is awaiting clearance of a jam. This is the quickest way to access the current jam code. To display the special fault history menu before clearing a jam, do the following:

1. Remove the standard media tray from its secure insertion point. The tray does not need to be completely removed from its slot.
2. Enter the "hidden" fault history menu by holding the Left arrow button down and pressing the Help button.

Chapter

Chapter 5

Cleaning and Maintenance

This chapter describes the cleaning procedures to keep the printer in peak operating condition. Some cleaning procedures, such as purging the ink-jets are done automatically when necessary. Other procedures, such as scrubbing the paper-feed rollers with an alcohol-soaked cloth, must be done by customers. The chapter is presented in the following sections:

Cleaning Overview 5-3
    Cleaning Supplies Required 5-3
Cleaning Page 5-5
Vacuum 5-7
Drum Temperature Sensor 5-9
Maintenance 5-9

Cleaning Overview

The printer should be cleaned when any of the following symptoms occur:

- Light stripes appear in prints.
- Ink smears or random streaks appear on the front or back of prints.
- Oily spots appear along the top of prints.
- Mispicks or multiple picks occur at the media tray.
- Persistent paper jams inside the printer or at the media tray.
- Wiggly vertical stripes caused by too much oil created by a dirty maintenance drawer blade.

Most print-quality and media-transport problems can be cured by initiating cleaning procedures available through the printer's front panel menu.

Cleaning Supplies Required

The following cleaning supplies are required:

- 90% or higher, pure isopropyl alcohol
- Lint-free wipes
- Lint-free swabs

CAUTION

Do not use rubbing alcohol because it can contain water and oils that leave undesirable residue on the printer parts. Never use water to clean the printer's internal components.

Appropriate cleaning procedures for specific print-quality or paper transport problems are listed in Table 5-1.

Table 5-1. Problems and Cleaning Procedures

Problem Type	Solution
Light stripes or missing colors	
Missing or light stripes on prints	Select the automated procedure Clean Jets from the front panel Troubleshooting menu.
Ink smears, oil spots or random ink streaks	
Ink smears on the front, back or edges of a page	Select the automated procedure Remove Ink Smears from the front panel Troubleshooting menu.
	Check the drum maintenance tray for ink.
Oil (drum fluid) on top edge of print	Select the automated procedure Remove Ink Smears from the front panel Troubleshooting menu.
Media jams	
Paper-pick or jamming problems at the tray	Clean the pick roller.
Paper jamming problems at the front door	Clean the transport rollers. Use the blue thumbwheel on the duplex roller to manually rotate the rollers.
Paper jamming problems at the exit	Clean the exit rollers and the stripper fingers. Use the blue thumbwheel on the duplex roller to manually rotate the rollers.
Paper-pick or jamming problems at the lower tray feed roller	Clean the Auxiliary Feeder Unit assembly.
Double picks	Clean pick pad with 90% alcohol.

NOTE: Media jams are usually caused by bad media or a hardware fault (i.e., a defective sensor). Most jams will not be resolved by cleaning rollers, so carefully observe the media and the results of the service diagnostics when troubleshooting media jams.

Cleaning Page

Under certain conditions, the printer purges its ink-jet nozzles to clear any jets plugged with ink. When the purge is completed, the printer outputs a cleaning page to clear the purge pattern from the print drum. Ink jets are purged under the following conditions:

- During warm-up from a power-off condition.
- When the printer exits the Energy Star mode.
- When customers initiate the Print Jet Test Page automatic cleaning procedure from the front panel Troubleshooting menu.

Vacuum

Vacuum dust from the top cover, the metal heat shield over the printhead and plastic dust cover under the stripper fingers. Dust should also be vacuumed from the vents, near the fans and anywhere else where it is observed.

Drum Temperature Sensor

With a dry swab, clean any buildup around the drum temperature sensor. You can access the sensor through the opened stripper finger cover. Also make sure the sensor rides evenly on the drum surface. You can remove the sensor, if necessary, to clean under it.

Maintenance

Maintenance roller

The printer uses the maintenance roller as part of its self-maintenance routine to coat the print drum with oil before each print. The maintenance roller (and its counter) must be replaced after 15,000 prints (the starter maintenance roller must be replaced after 7,500 prints). A front panel message indicates when the maintenance roller is low. Printing is still possible when the maintenance roller fluid is low. When a front panel message indicates the maintenance roller is "empty," the maintenance roller and its counter must be replaced before continued printing is possible. Refer to the instructions included with the kit to replace the maintenance roller kit.

*NOTE: The Drum Maintenance Unit Replacement Kit has a **one** year shelf life.*

NOTE: The drum fluid, an oil, poses no known adverse health effects. Refer to the Material Safety Data Sheet for more information.

The number of remaining cycles can be obtained from the front panel as follows.

1. Allow the printer to warm up to its idle, "Ready to Print," state.
2. Scroll to the Info selection and press the Select button.
3. Repeat for the menus Consumables and Maintenance Kit Information.
4. Scroll to the item Prints remaining. The number of remaining oiling cycles is displayed following the colon.

When the number of remaining oiling cycles reaches 1000, the front panel automatically displays the count as part of status message indicating that the maintenance kit is low. A replacement kit should be ordered at this time. The kit-low message remains, counting down the number of remaining oiling cycles, until the count reaches 0. At that point, the message is updated, stating that the kit is empty and requires replacement. The printer will no longer print until the maintenance drawer is replaced.

The front panel messages are accompanied by similar messages emitted over the back-channel. These are "maintenance kit low" and "maintenance kit exhausted." While the drawer is in the process of being replaced (that is, whenever it is removed), the back-channel emits "maintenance kit missing."

In addition, one other back-channel message is associated with the maintenance drawer. The message is "waste liner full: please empty." This indicates the waste-ink tray must be emptied before normal operation will resume. For quick reference, the front panel displays additional instruction.

Waste Tray

The maintenance drawer contains a waste tray that collects the ink that has been purged from the printer's ink jets. The waste tray should be emptied each time the maintenance drawer is removed from the printer. Refer to "Emptying the Waste Tray," in the *iiLINX™ Solid Inkjet 100 User Manual* for instructions on removing and emptying the waste tray. Be sure to insert the waste tray into the maintenance drawer before reinstalling the maintenance drawer in the printer. Never reuse waste ink in the printer.

Lubrication

Tools and supplies required

- Light oil
- Grease (Nye Rheolube 368B)

In general, all of the printer's bearings and motors are lifetime factory-lubricated. However, over time and under certain extreme operating conditions, oil and grease may dry out, causing squeaks and rumbling noises in the printer. Look for fine metal particles — a clear sign of an old or worn bearing. Under these circumstances, replace the bearing or the assembly.

A drop of grease on a noisy bushing will quiet a noisy printer. Too much lubrication can get into the paper path and attract dust, so apply lubrication sparingly.

Lubricate the following only when needed:

- **Bushings:** Apply a drop of light oil to a bushing if it is noisy or running dry.
- **Plastic gear train:** The gear train from the process motor to the paper-feed module requires only a small amount of white grease for noise reduction purposes. Apply grease sparingly so that it does not fling off of the gears when they turn. You need only to apply a dab of grease to a single gear and the grease will migrate throughout the entire gear train. Do not apply oil to gears; only use approved grease.

NOTE: Do not apply lubricant to the head tilt gear or the head tilt gear guide.

- **X-axis drive.** Apply a *small* amount of grease on the tip of the nose cone. Apply a *small* amount, 3 dabs, on the threads of the X-axis shaft.
- **White (nylon) plastic bearings and cams:** No lubrication required.

Inspection

Rollers: Replace the rollers when you see any of the following defects:

- Flat spots.
- Out of roundness.
- Cracked rubber.

- Loss of traction (tackiness) causing pick or feed failures.

Gears: Replace gears that show any signs of wear or breakage. Look for these problems:

- Thinned gear teeth.
- Bent or missing gear teeth; check especially where a metal gear drives a plastic gear.
- Fractured or cracked gears. (Oil or incorrect grease on a plastic gear can cause the gear to crack.)

Belts: Inspect the belts for wear. There are eight rubber belts in the printer:

- A belt from the process motor to the compound gear
- Two belts from the y-axis motor drive
- A belt from the lower paper feed roller to the upper paper feed roller
- Two belts on the cap/wipe/purge drive
- An exit roller drive belt
- A small belt for driving the cap/wipe purge assembly from the cap/wipe/purge clutch

Look for these problems:

- Loose rubber particles below the belts indicate a worn belt.
- Missing teeth in the belts.
- Cracking or moderate fraying; a small amount of fraying is inevitable, so look for other signs of wear before replacing the belt.

Clutches: There are four clutches: the paper-pick roller clutch, the upper feed roller clutch, the maintenance drawer cam clutch and the cap/wipe/purge clutch. Symptoms of a malfunctioning clutch are the printer not picking paper from the tray or other paper jams. Also the cap/wipe/purge system could fail. In such cases, replace the clutch.

Preventative Maintenance Checklist

- ❑ Clean feed rollers, exit rollers and guides and stripper fingers only when ink or debris is visible.
- ❑ Clean upper and lower tray pick rollers only when ink or debris is visible.
- ❑ Clean maintenance drawer wiper blade.
- ❑ Clean (dust or vacuum) interior and exterior of printer, including fans and air inlets/outlets on cart.
- ❑ Inspect cap/wipe/purge gasket, wiper blade, and printhead faceplate; if gasket or wiper is damaged, or printhead faceplate has streaks, replace cap/wipe/purge assembly.
- ❑ Check optical density; if necessary calibrate optical density or replace printhead.
- ❑ Check print quality using Quality Test; clean printhead or adjust printhead-to-drum gap and X-axis scale factor.
- ❑ Check for “cooked” or discolored inks; flush out discolored inks.
- ❑ Check print engine and PostScript firmware versions; install current firmware version (supplied by Service.)
- ❑ Review proper operation of printer using a customer file, if possible.
- ❑ Review with the customer all work that was performed and how to properly care for printer.

Chapter 6

Chapter 6

Removal and Replacement

This chapter provides steps to remove and replace key printer Field Replaceable Units (FRUs). After a brief discussion about the importance of locking the printhead, hardware and then software repair and replace procedures are provided.

WARNING

Sharp burrs and/or edges are present inside the printer. Use caution when servicing equipment.

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Locking the Printhead

During normal power-down, the printer tilts the printhead back and energizes the X-axis drive to move the printhead to the far right. This allows the printhead's tilt arm, which moves as the printhead moves, to engage a pin protruding from the left-side printer frame. This effectively automatically locks the printhead in place for moving and shipping. The printer will not lock the printhead if any printer door is open.

CAUTION

After servicing the printer with power off, never leave the printhead in the tilted-forward, far-right position. Upon power-up, the printhead will be tilted backward and the head tilt arm will crash into the head lock pin. This can damage process gears and belts driving the tilt arm.

After servicing the printer. When you service the printhead, X-axis drive, cap/wipe/purge assembly or other relevant printer components, leave the printhead in its print position, centered in front of the drum. Upon power-up the printer can safely move the printhead.

Manually locking the printhead. If you must manually lock the printhead:

1. Disconnect the head tilt spring.
2. With the printer powered off, carefully tilt the printhead back about two-thirds of the way by rotating the compound gear.

CAUTION

Do not allow the spring-loaded printhead to fall forward or it may damage the drum.

3. Manually rotate the X-axis drive gear to move the printhead to the right extreme of its travel. Ensure the lock pin on the left side of the printer frame properly engages the slot in the head tilt arm.
4. Rotate the X-axis gear in the opposite direction about one rotation. This prevents the X-axis drive from binding so tightly that the motor cannot free it upon power-up.
5. Reinstall the head tilt spring.

Removing the Covers

Removing the Right and Left Covers

1. Open the front door.
2. Remove the two screws securing the left (or right) cover in place. A sheet-metal screw secures the cover inside the front door. A machine screw secures the cover at the rear cover.
3. Remove the left (or right) cover.

NOTE: For reassembly, note how the cover interlocks with the bottom of the printer frame. Pushing in on the bottom-center of the cover helps to lock it in place.

Reverse these steps to install the right or left cover.

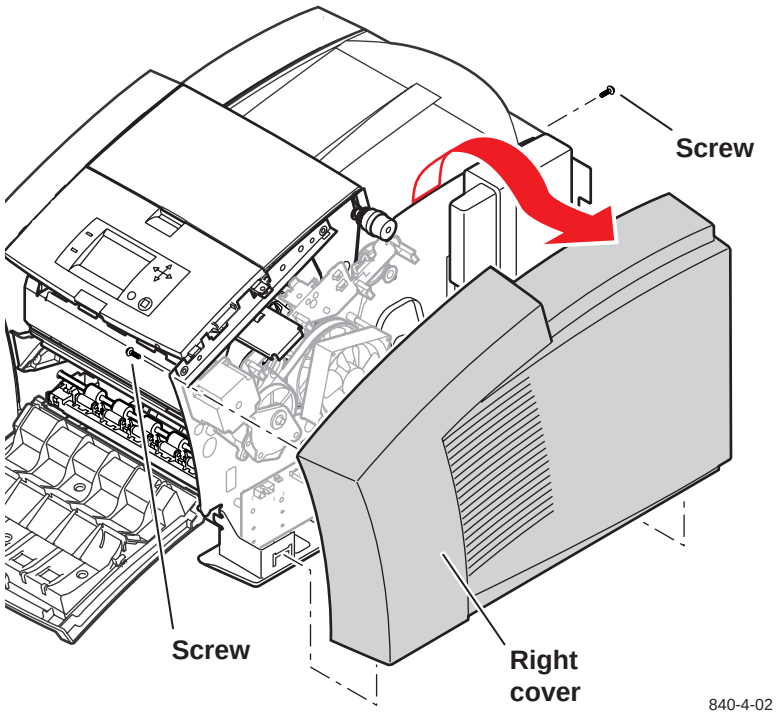


Figure 6-1. Removing Right Cover

Removing the Top Cover

NOTE: Vacuum dust out of the top cover before you remove it.

1. Remove the right cover.
2. Remove the left cover.
3. Open the ink load door and tilt it back. Unclip the ink load door arms from the ink loader's spring crossarm.
4. Slide the ink loader's spring crossarm to the rear of the ink loader. Note how pins on the ends of the ink-loader crossarm align with notches in the top cover for removal.
5. Remove the four screws securing the top cover in place.
6. Tilt up the rear-end of the top cover and lift and remove the top cover.

Reverse these steps to install the top cover.

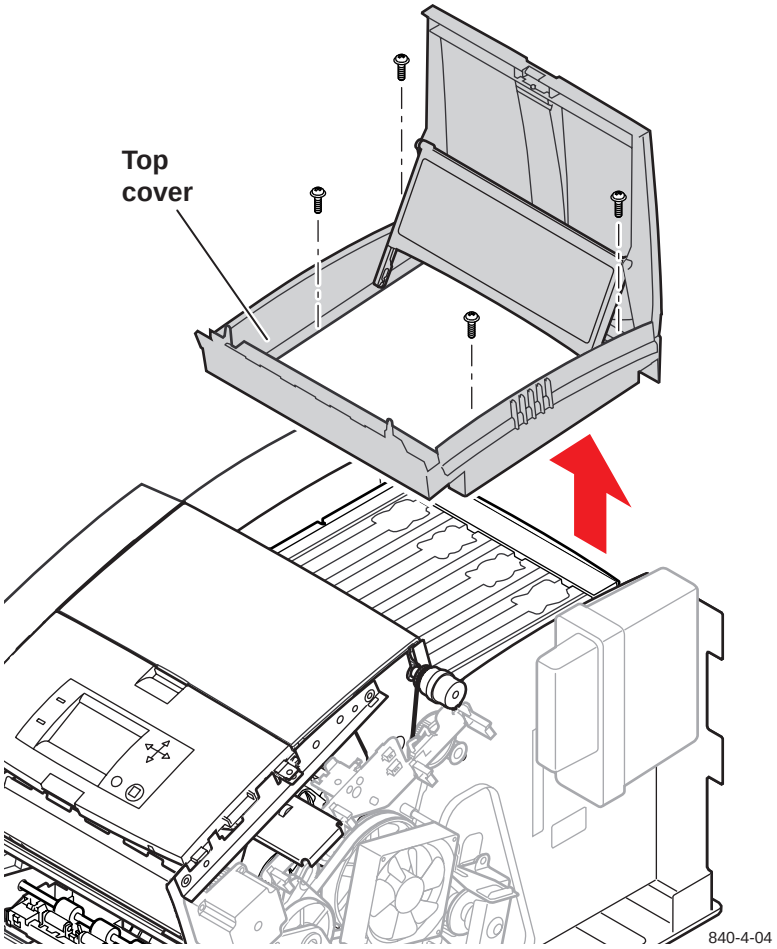


Figure 6-2. Removing Top Cover

Removing the Rear Cover

1. Remove the right cover.
2. Remove the left cover.
3. Remove the top cover.
4. With the top, right and left covers removed, remove the rear cover.

Reverse these steps to install the rear cover.

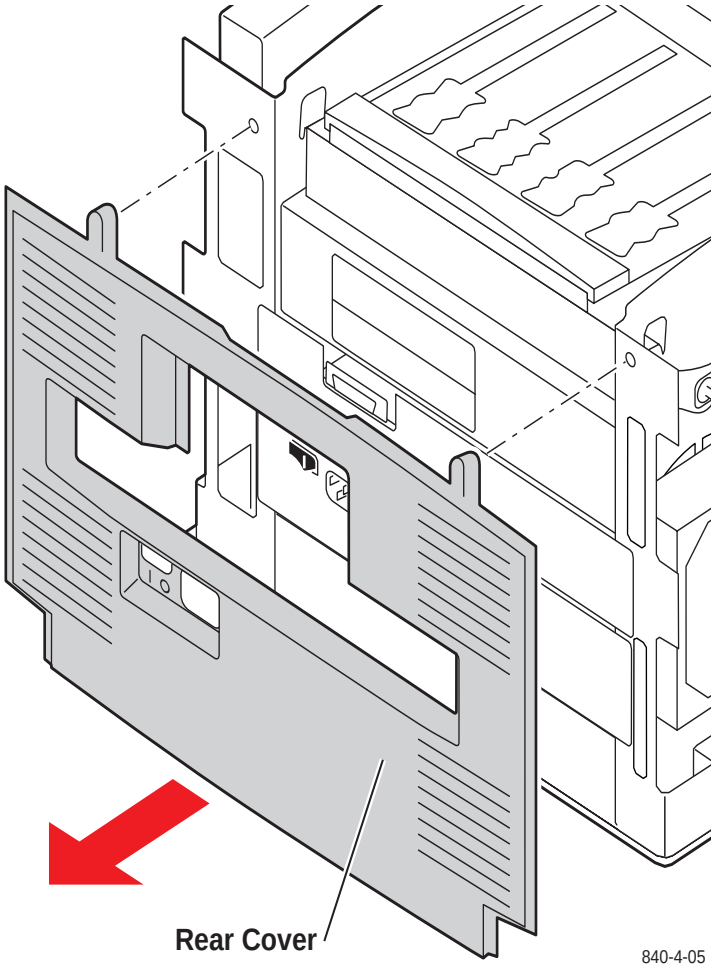


Figure 6-3. Removing Rear Cover

Removing the Front Panel

1. Open the exit door.
2. Remove the right and left covers.
3. Remove the three screws securing the front panel. One of the screws is located inside the exit door area.
4. Disconnect the front panel display wiring harness from the right I/O board. Slide the front panel rearward slightly, lift and remove the front panel.

Reverse these steps to install the front panel.

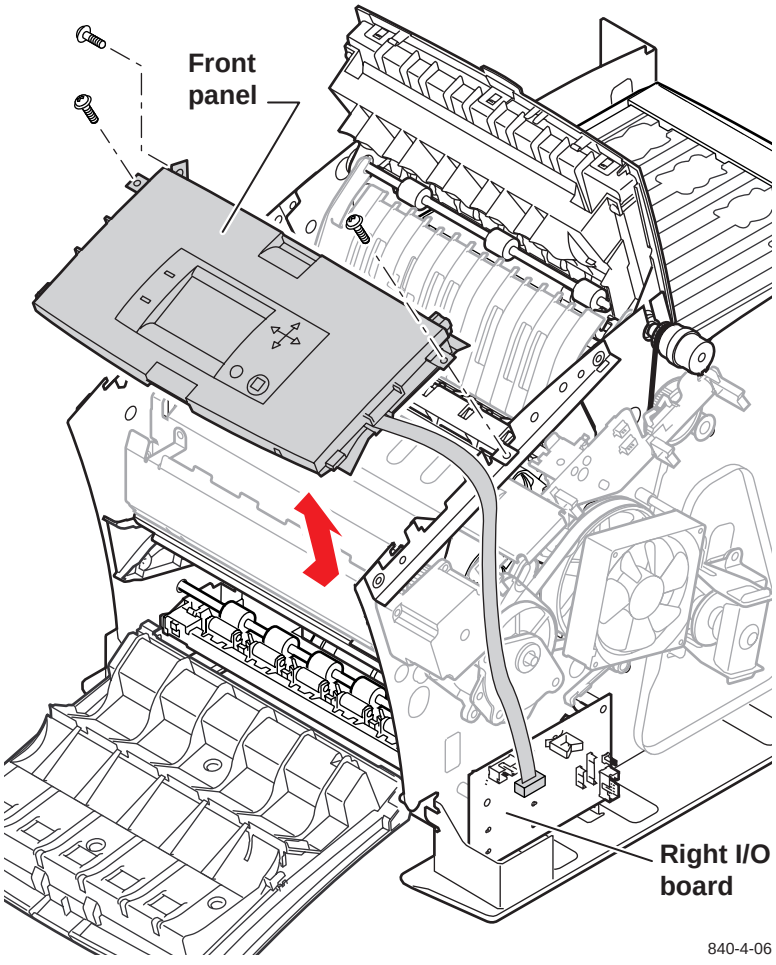


Figure 6-4. Removing Front Panel

Removing the Front Door

1. With a small, flatblade screwdriver, press the release lever on the front door left pivot. The release is located inside a small hole on the left pivot.
2. Slide the door's right pivot off the right frame post.
3. Remove the front door.

Reverse these steps to install the front door.

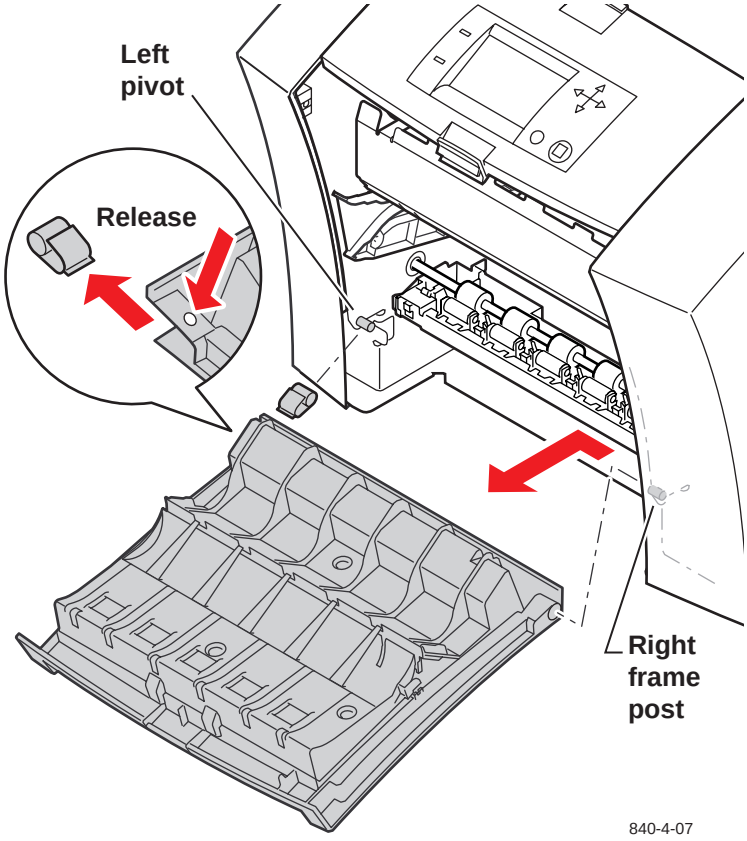


Figure 6-5. Removing Front Door

Removing the Exit Door and Exit Roller

1. Remove the right cover.
2. Remove the left cover.
3. At the right side of the printer, remove the cap/wipe/purge electric clutch. Use a small, flatblade screwdriver to release the clutch from the shaft. Also remove the right-side keyed, white plastic bushing.
4. At the left side of the printer, release the tension on the exit roller drive belt. Slip the belt off the exit roller drive pulley.
5. Use a small, flatblade screwdriver to release the drive pulley from the exit roller shaft. Also remove the left-side keyed, white plastic bushing.
6. Remove the exit roller, lower exit guide and exit door from the printer.
7. Unclip the lower exit guide from the exit roller.
8. Slide the exit roller out of the exit door.

Reverse these steps to install the exit door.

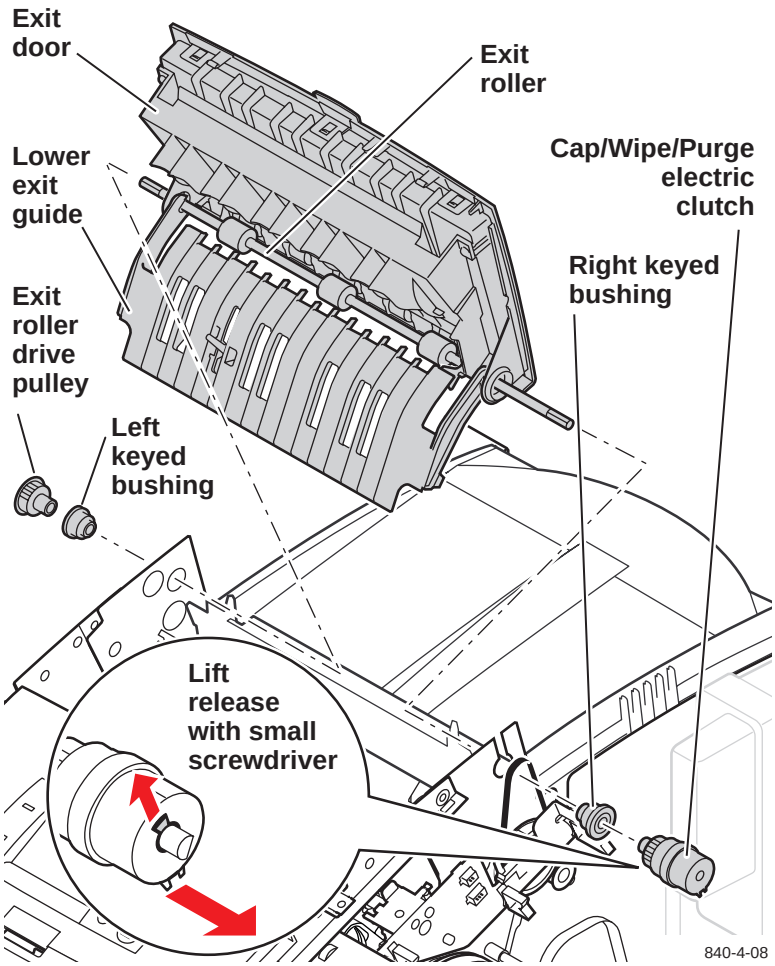


Figure 6-6. Removing the Exit Door and Exit Roller

Removing the Ink Loader

WARNING

Even when the printer is turned off, AC line voltages may be present at the printer heaters while the printer is plugged into AC power.

1. Turn off the printer and remove the power cord. Allow the ink loader to cool.

WARNING

Hot waste ink from a cleaning operation drains to the waste ink tray where it cools. Avoid a burn hazard by allowing the printer time to cool before continuing.

2. Remove the right, left and top covers.
3. Remove the vacuum/pump module.
4. Disconnect the two wiring harnesses leading to the ink loader.

WARNING

Do not dangle the ink loader by its connector over the side of the printer as it may result in an intermittent connection and faulty ink sense.

5. Lift and remove the ink loader.

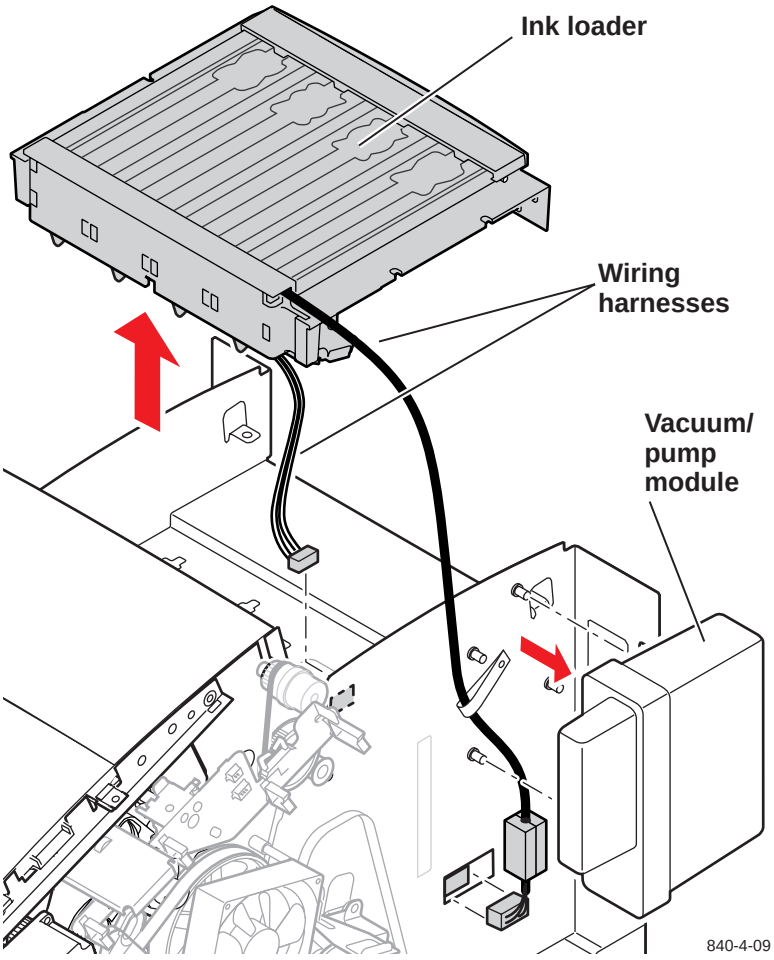


Figure 6-7. Removing the Ink Loader

Reverse these steps to install the ink loader. Refer to "Wiring Diagrams" in Appendix C for illustrations showing how to route the ink loader's wiring harness.

Removing the Left Fan

1. Remove the left cover.
2. Disconnect the wiring harnesses leading to the left fan.
3. Remove the two screws securing the left fan to the side frame. Remove the fan.

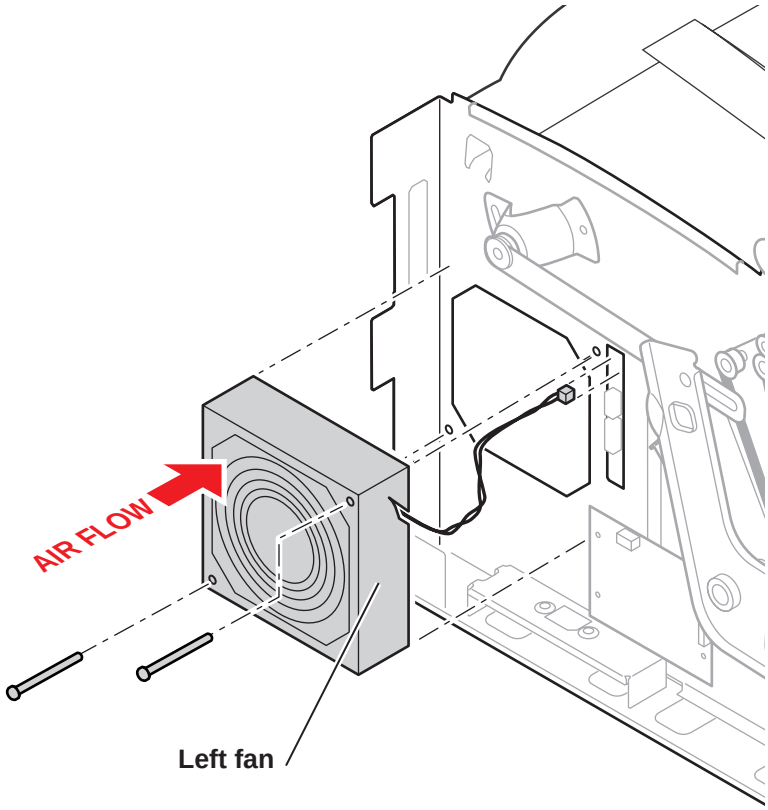


Figure 6-8. Removing the Left Fan

Reverse these steps to install the left fan. Orient the fan so it blows inward.

Removing the Drum Fan

1. Remove the right cover.
2. Disconnect the drum fan's wiring harnesses.
3. Remove the three screws securing the drum fan in place. Remove the fan.

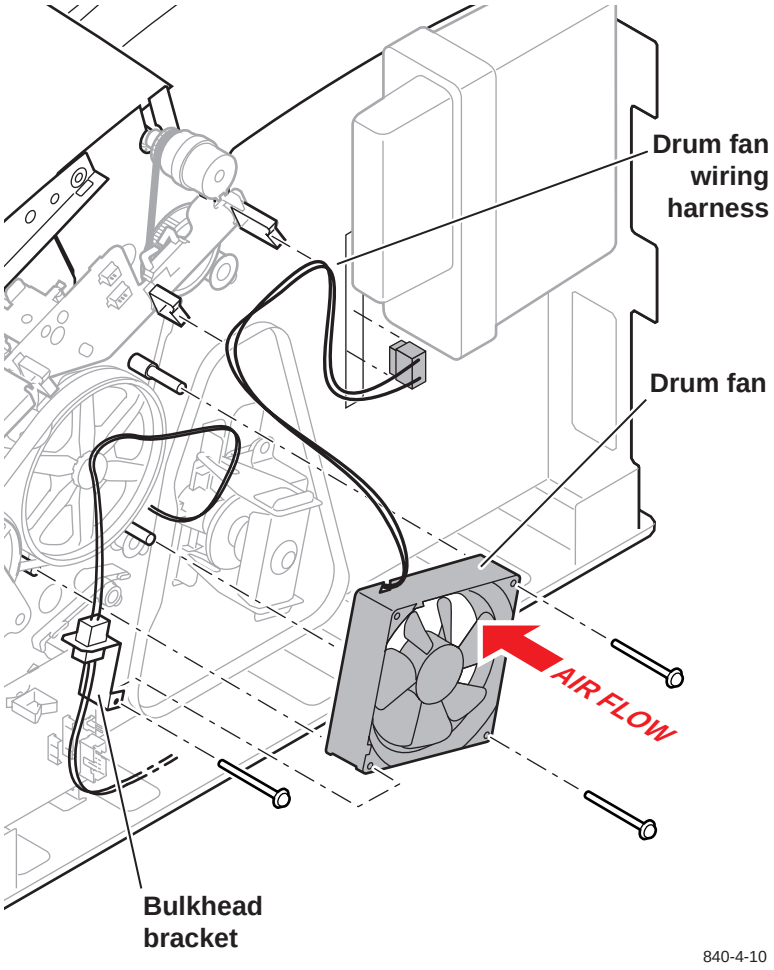


Figure 6-9. Removing the Drum Fan

Reverse these steps to install the fan. Orient the fan so it blows inward. Be sure to mount the cap/wipe/purge wiring harness bulkhead bracket to the lower left of the fan. Refer to "Wiring Diagrams" in Appendix C for an illustration showing how to dress the drum fan wiring.

Main Board

1. Power down the printer. Leave the power cord plugged in to provide a ground path for static discharges. Remove the interface cables.
2. Loosen the two rear panel securing screws.
3. Slide out the main board. Refer to Figure 6-9.

If you are replacing the main board, transfer the socketed realtime clock/NVRAM chip and the printer ID chip (location U390) to the new board so the printer's settings and Ethernet address are retained. Also swap the code ROM DIMM and the SDRAM DIMMs.

Reverse these steps to install the main board.

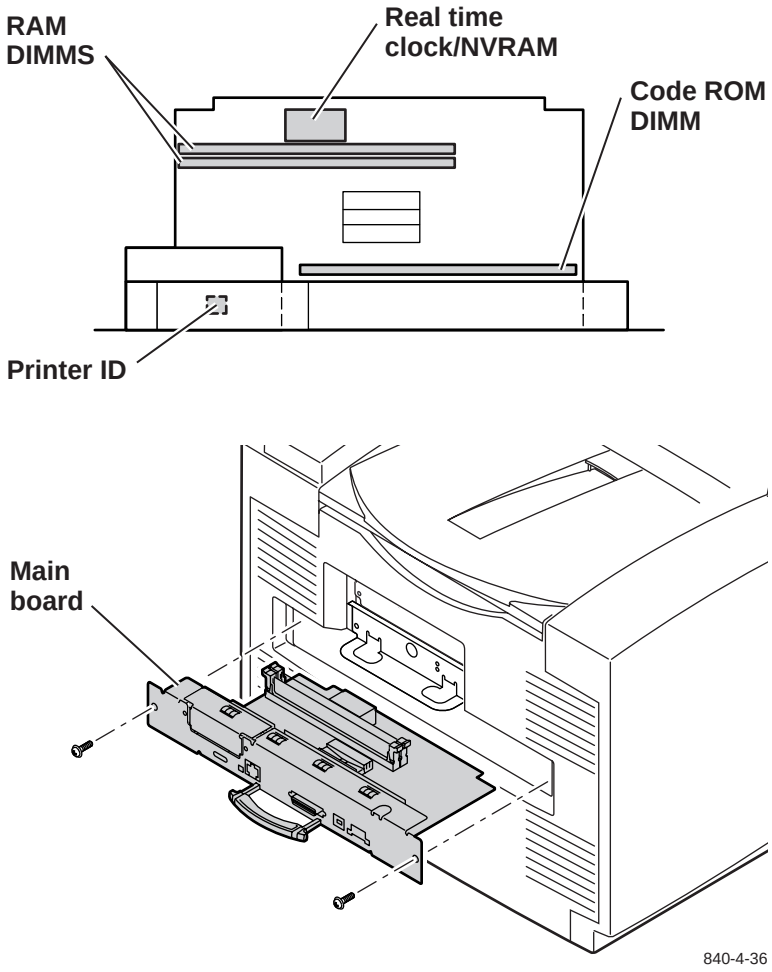


Figure 6-10. Removing the Main Board

Power supply

WARNING

Even when the printer is off, AC line voltage may be present at the printer heaters while the printer is plugged into AC power.

1. Turn off the printer and remove the power cord.
2. Remove the right cover.
3. Remove the left cover.
4. Remove the rear cover.
5. Remove the top cover.
6. At the right side of the printer, disconnect the two wiring harnesses leading to the power supply. Refer to Figure 6-10.
7. Remove the four screws securing the power supply in place. Remove the power supply.

Reverse these steps to install the power supply.

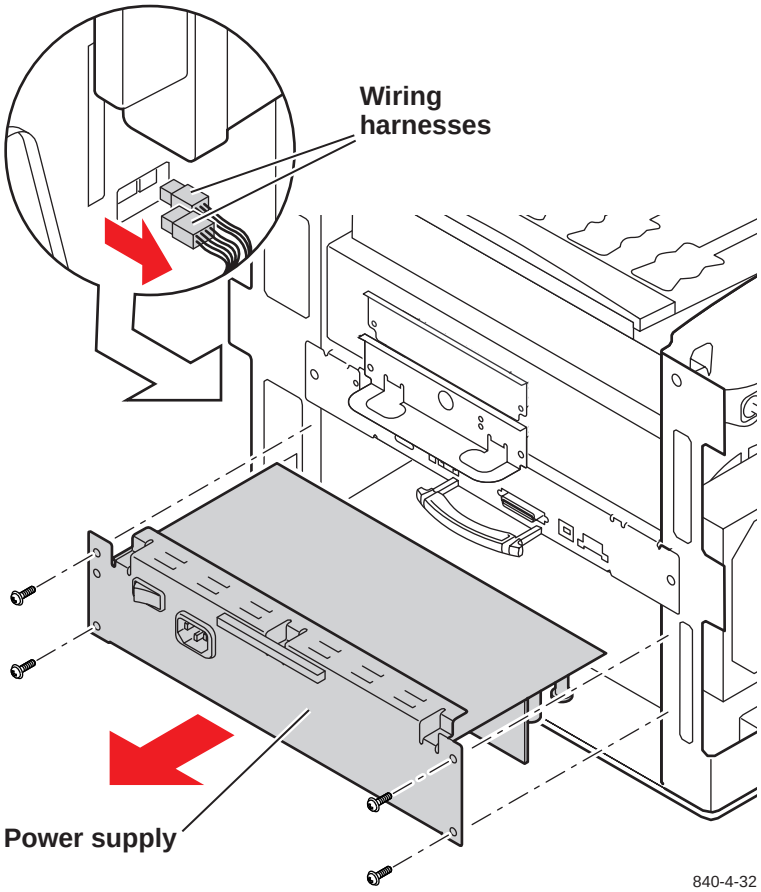


Figure 6-11. Removing the Power Supply

Power Control Board

1. Turn off the printer and remove the power cord.
2. Remove the right cover.
3. Remove the left cover.
4. Remove the top cover.
5. Remove the rear cover.
6. Remove the ink loader.
7. Remove the main board.
8. Remove the power supply.
9. Remove the network card or its cover plate, whichever is in place.
10. Remove the internal hard drive or cover plate whichever is in place.

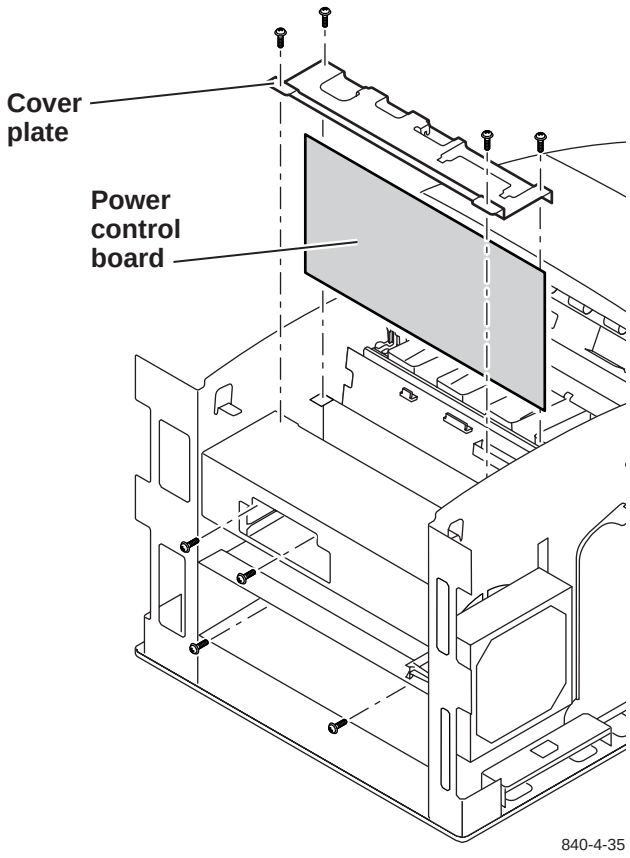


Figure 6-12. Removing the Power Control Board

11. Disconnect the wiring harnesses leading to the power control board.
12. Remove the four screws securing the power control board cover plate. Remove the plate.
13. Remove the four screws securing the power control board in place. Lift and remove the board.

Reverse these steps to install the power control board.

Paper/Drum Heater

WARNING

Disconnect the power cord. AC voltages may be present at the heaters, even with the printer turned off.

1. Remove the right cover.
2. Remove the left cover.

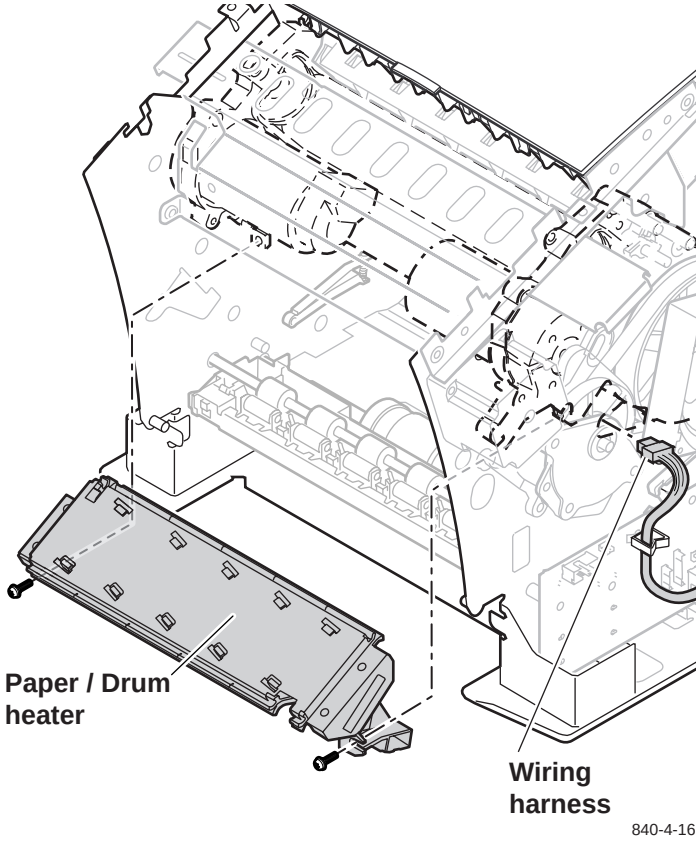


Figure 6-13. Removing the Paper/Drum Heater

3. Remove the upper feed roller as described in the topic “Upper feed roller assembly.”
4. Disconnect the locking wiring harness from the right side of the paper/drum heater.

5. At the front of the paper/drum heater remove the two screws securing the heater to the inside of the printer frame. Do not confuse the mounting screws with the nearby smaller, brass-colored assembly screws.

Reverse these steps to install the paper/drum heater.

Upper Feed Roller Assembly

1. Remove the right cover.
2. Remove the left cover.
3. Disconnect the head tilt spring.
4. **Left side:** Remove the upper feed roller electric clutch from the end of the upper feed roller shaft by moving the locking tab on the clutch away from the shaft.
5. Remove the feed roller drive belt and compound gear from the left end of the upper feed roller. Note the small slot in the compound gear to ease removal.

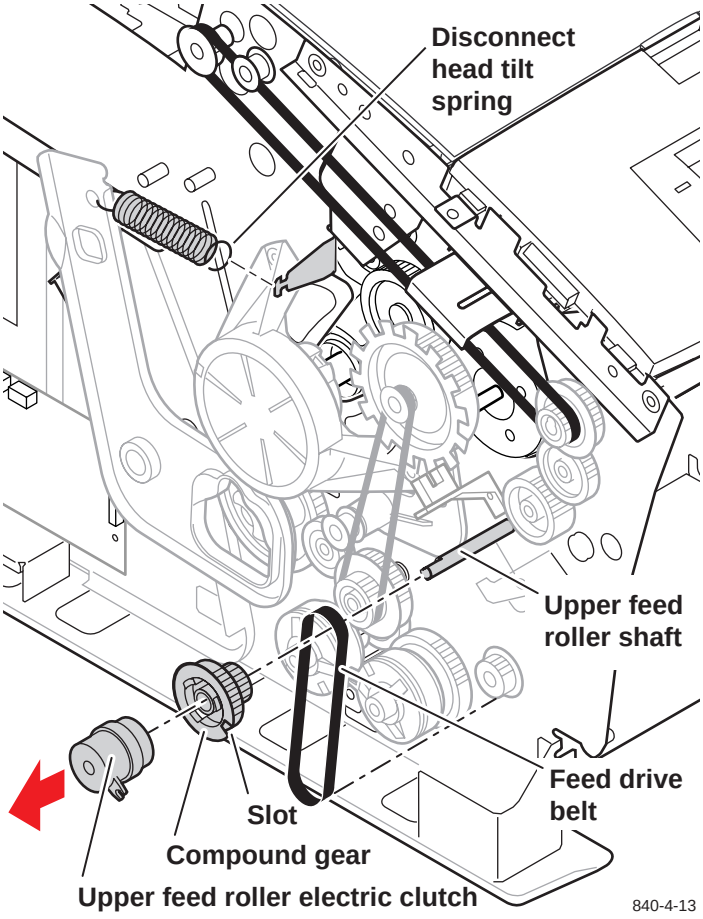


Figure 6-14. Remove the Upper Feed Roller Assembly (left side)

6. **Front:** Open the front door and remove the drum maintenance drawer. Also, remove the bright, metal duplex paper guide from the front of the printer. It is held in place with two screws.

7. Remove the left and right maintenance drawer guides. Each is held in place by a single screw at the front and two frame latches at the rear.

NOTE: If you have trouble removing the right maintenance drawer guide, manually rotate the X-axis drive to move the printhead (in its forward position) to the center of its travel.

---

8. Remove the screw securing the right side of the upper feed roller assembly to the inside of the printer frame.

9. Disconnect the wiring harness leading from the upper feed roller assembly to the inside the left side of the printer frame.

10. Remove the C-clip located on the left-inside printer frame securing the upper feed roller assembly in place.

11. Remove the upper feed roller assembly. Separate the assembly into its two halves.

Reverse these steps to install the upper feed roller assembly.

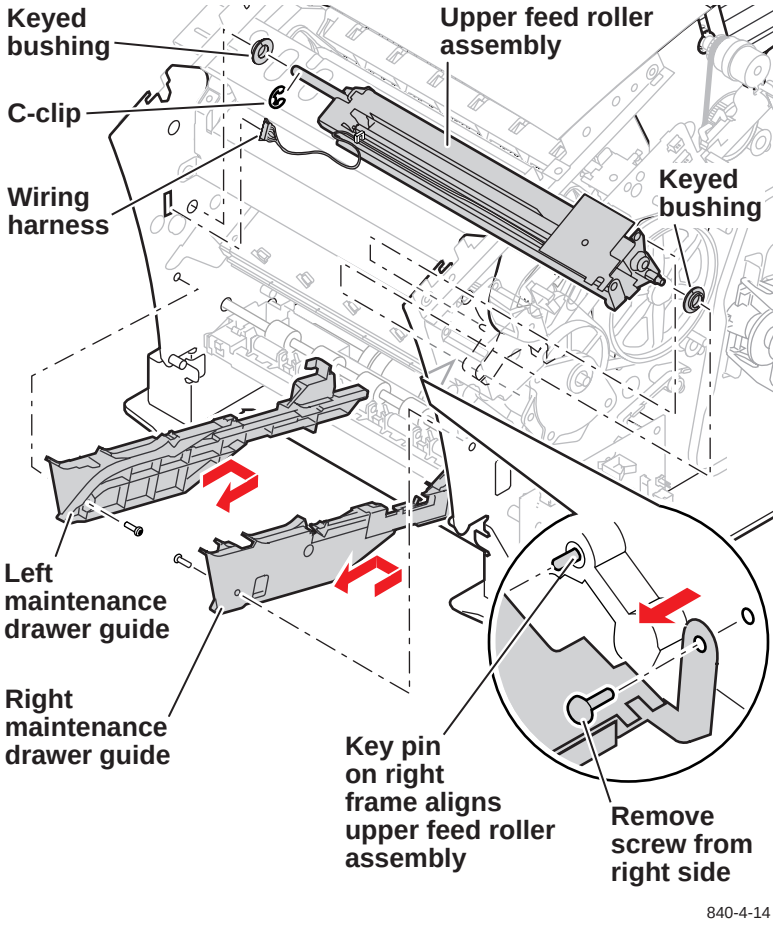


Figure 6-15. Removing the Upper Feed Roller Assembly (Front)

Drum/Transfix Assembly

NOTE: When the drum (see Drum / Transfix Assembly) is replaced, the new drum should be conditioned using the Seal Drum print suite before the printer is returned to normal service. The Seal Drum suite is comprised of five clear solid-fill prints.

1. Remove the right cover.
2. Remove the left cover.
3. Remove the front panel.
4. **Left side:** Free the wiring harness leading from the drum/ transfix assembly along the left side of the print engine to the power control board and left I/O board.
5. Remove the drum position sensor assembly.
6. Remove the upper feed roller assembly.
7. Remove the paper/drum heater.
8. Remove the drum temperature sensor.
9. Remove the C-clip securing the compound gear and remove the gear.
10. Loosen the exit roller drive belt tensioner. Remove the exit roller drive belt.
11. Remove the tilt arm spring.

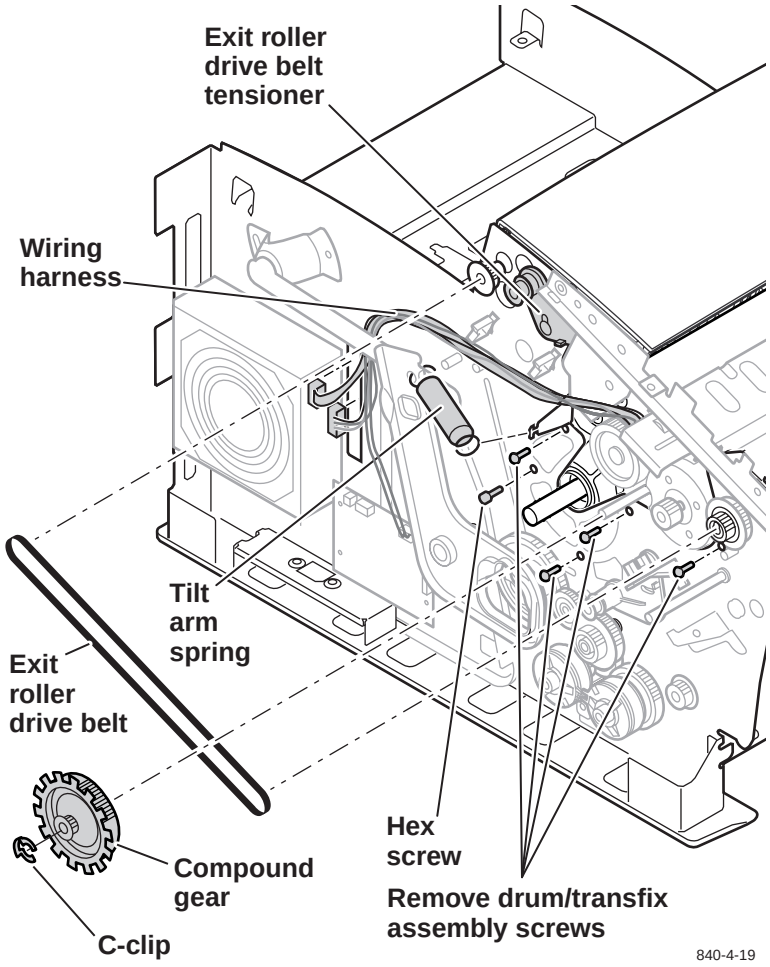


Figure 6-16. Removing the Drum Transfix Assembly (Left Side)

12. **Right side.** Remove the Y-axis belt drive assembly.

13. Disconnect the wiring harnesses leading to the transfix solenoid bracket. Remove the three screws securing the bracket in place and remove the bracket.

14. Remove the left and right frame bridges. Each is held in place with two screws.

15. Remove the two screws securing the front of the drum/transfix frame to the inside printer frame.

16. Remove the five screws securing the left side of the drum/transfix assembly to the print engine. Note that one screw is removed with a 3/32” hex key.

17. Remove the five screws securing the right side of the drum/ transfix assembly to the print engine. Note that one screw is removed with a hex key.

18. Carefully, lift and remove the drum/transfix assembly. Protect the drum surface.

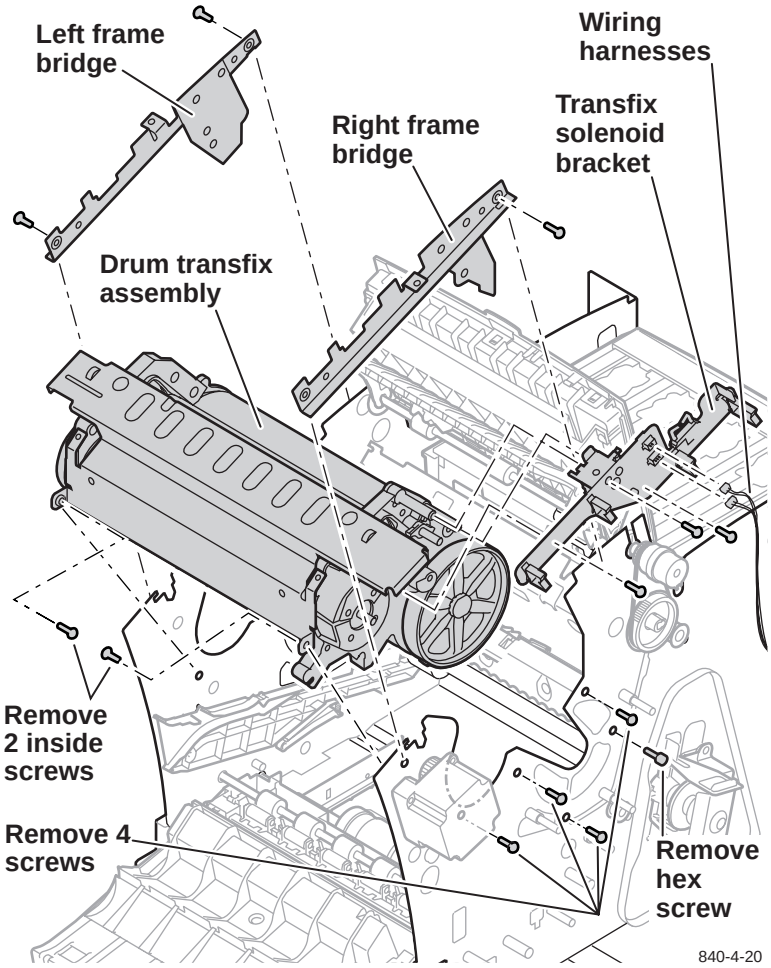


Figure 6-17. Removing the Drum/Transfix Assembly (right side)

Reverse these steps to install the drum/transfix assembly.

NOTE: Upon reassembly, install the hex-keyed screws first; they align the drum/transfix assembly to the engine frame.

Make these adjustments after installing a new drum.

1. Ensure the drum position encoder sensor gap.
2. Set the Y-belt tension; refer to the topic "Y-axis Belts Tension Adjustment"
3. Power up the printer in Bypass Mode to skip the startup and mud pages.
4. Enter the hidden Service menu and select Seal Drum to seal the new drum.
5. Perform the printhead to drum adjustment described in the topic "Printhead-To-Drum Spacing Adjustment."

Drum Position Sensor Assembly

1. Remove the left cover.
2. Remove the top cover.

CAUTION

Unhook the head tilt spring to avoid possible damage to the printhead and drum.

3. Disconnect the drum home-position sensor wiring harness from J180 of the left I/O board leading to the drum position assembly. Disconnect the drum position encoder sensor at the drum position assembly.
4. Remove the clear plastic dust cover from the drum position assembly.
5. Precisely mark the end of the drum shaft relative to the drum home flag on the drum position sensor assembly; this is not necessary if you are also replacing the drum (as part of the drum/transfix assembly).

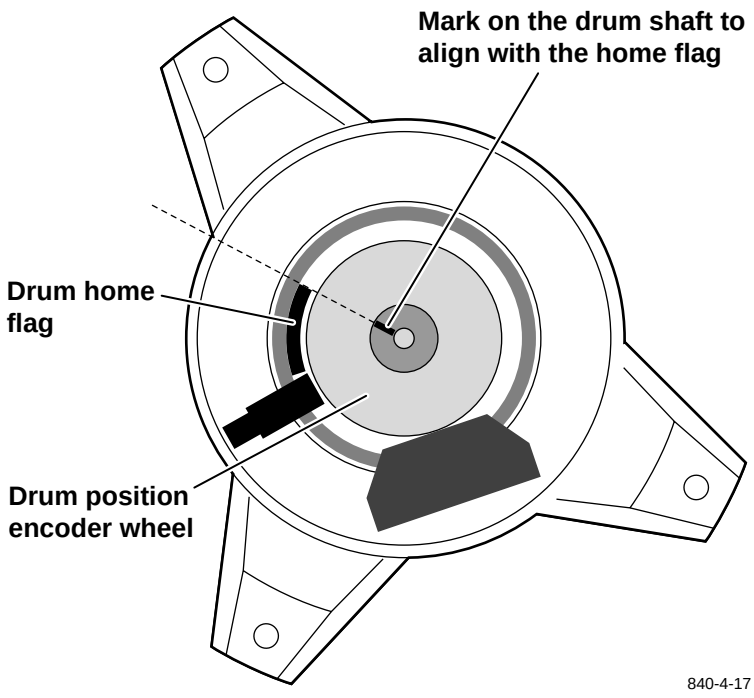


Figure 6-18. Marking the Drum Home Flag Sensor Alignment

6. Rotate the tilt gear to orient the gear's missing teeth to the drum position sensor assembly's rear mounting screw.

7. With a small, flatblade screwdriver, slide the retaining spring out of the encoder wheel's groove toward the encoder disk.

8. Remove the three screws securing the drum position sensor assembly housing to the print engine. Insert the gap tool to hold the encoder wheel in position. Slide the assembly off the drum shaft. If necessary, use the small flat-blade screwdriver to push the encoder disk hub along the shaft as you remove the assembly.

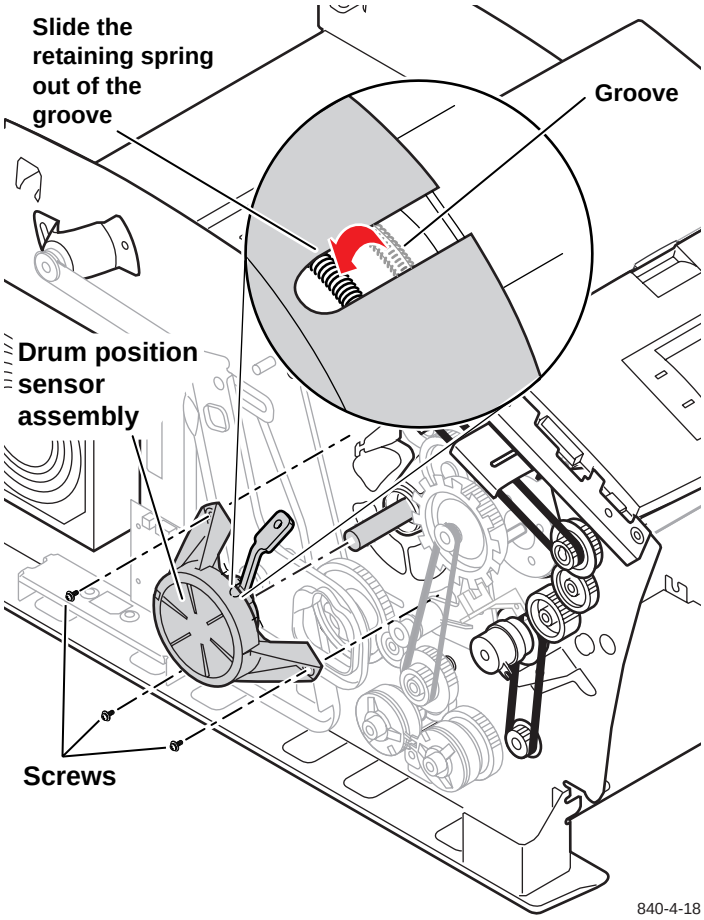


Figure 6-19. Removing the Drum Position Sensor Assembly

Reverse these steps to reinstall the drum position sensor assembly. The drum must be in the same position relative to the drum position encoder wheel when the drum position sensor assembly was removed. This ensures that the stripper fingers contact the drum in the same location as before; otherwise, print artifacts will result.

- Install the encoder wheel on the drum shaft, *precisely* aligning the home flag to the alignment mark drawn on the shaft.
- Use the encoder wheel gap tool to space the encoder wheel to the drum position sensor.

Printhead

WARNING

Even when the printer is turned off, AC line voltages may be present at the printer heaters while the printer is plugged into AC power. *The printhead is hot.*

1. Remove the right cover and the left cover.
2. Disconnect the head-tilt spring.
3. Remove the top cover.
4. Remove the ink loader.
5. Remove the metal heat shield from over the printhead.
6. Disconnect the power wiring and data harnesses leading from the printhead to the power control board. Also disconnect the two ground wires from the printer frame.
7. Carefully plug the printhead's reservoir chamber holes with the silicone plugs. The plugs keep liquid ink from spilling if you should inadvertently tip the printhead.

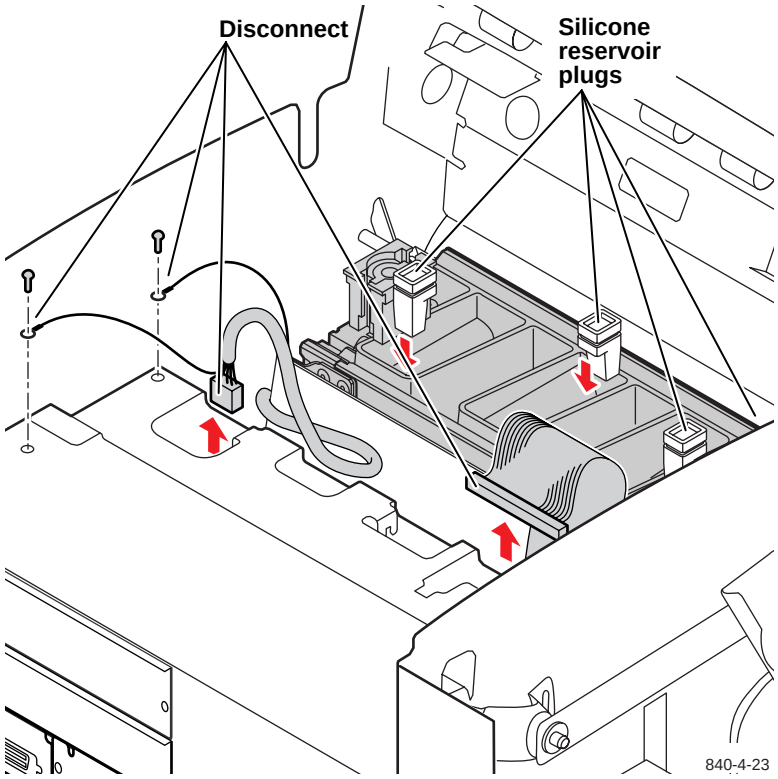


Figure 6-20. Plugging the Reservoir Holes

8. Rotate the removal tool's plastic leg into its up position. Slide the removal tool's standoff locks inward.

9. Place a few sheets of paper between the printhead and the drum to protect the drum surface.

10. Carefully, lower the printhead removal tool onto the printhead. Rotate the process motor to tilt the printhead forward about 2.5 cm (1 inch).

11. Slide the standoff locks outward to secure the tool to the printhead. Loosen the two mounting screws securing the printhead in place.

12. Lift and remove the printhead. Lower the removal tool leg to safely restthe printhead on a flat surface.

13. Using the printhead removal tool, reverse the removal steps to reinstall the printhead.

14. Perform the Cold Printhead-to-Drum Spacing Adjustment and then the Hot Printhead-to-Drum Spacing Adjustment.

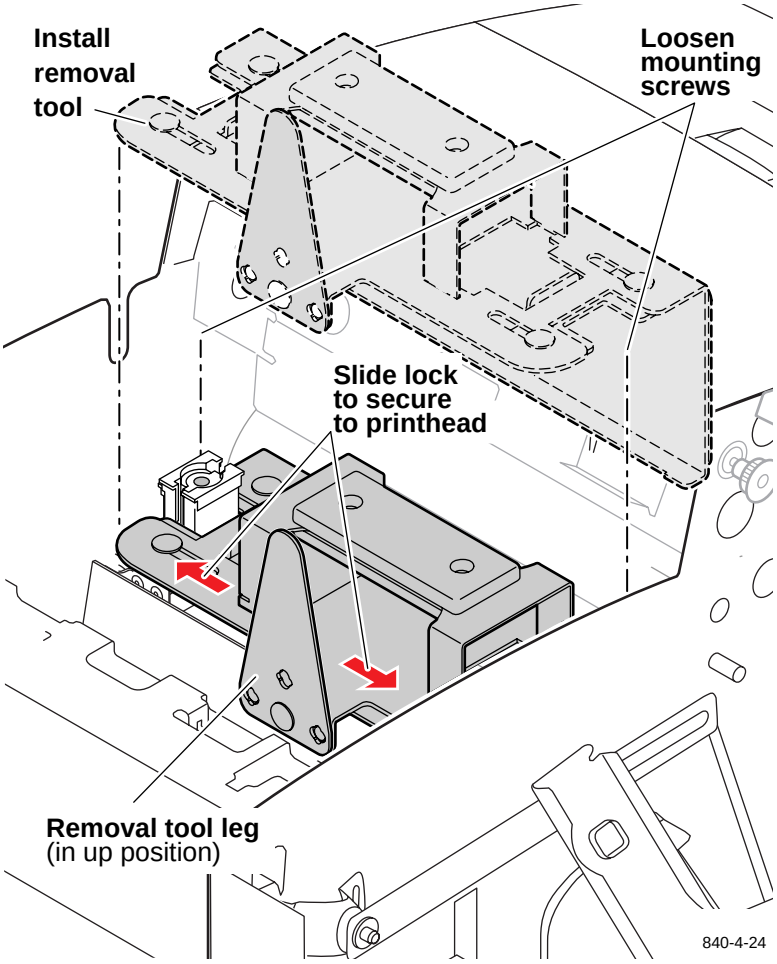


Figure 6-21. Removing the Printhead

Installation. If not already in place, install the printhead's data ribbon cable to the printhead.

1. Install the printhead with the tile mount about half-way back. Work the head up/down on each side to be certain the head is all the way down and seated. Then tighten the two mounting screws so they are snug.

2. Loosen the printhead's four (Head-to-Drum HTD) gap adjustment screws and push the printhead away from the drum; then tilt the printhead to its print position by turning the process gear on the left side of the printer and attach the head tilt spring. The head tilt arm will be seated at the end of the slot of the steel band.

3. Torque the mounting screws to 20 in./lbs.
4. Perform a “Cold” Printhead-To-Drum Spacing Adjustment, followed by a “Hot” Printhead-To-Drum Spacing Adjustment.

X-axis Motor And Drive Assembly

Reveiw these general operation requirements before servicing the X-axis motor and drive assembly.

- Home Position. The printer is completely “dumb” about where the head is other than based on motor count tracking in RAM after homing. Accurate homing is dependent on a free moving head/shaft assembly. When the X-axis is free to move, homing can be verified by audibly listening to the “tick” sound as the motor continues to drive after the head travel limit is attained. Moving the X-axis by manually turning the gear will require power cycling the printer to reestablish the correct home location.
- Friction. Print quality could suffer if the X-axis drive system friction becomes too high. Lack of lubricant at the interface between the nose cone and yoke can increase friction and wear considerably. Excess friction at the leadscrew/gear interface would also occur if not properly lubricated.
- Parking Bind. Under unusual circumstances the X-axis could become bound up when parked. This would most likely occur if the interface between the gear and stop collar was not lubricated. Drive parameters have been optimized to prevent binding. However, if such a bind does occur, it can result in either no X-axis movement or a delay in coming off the collar, which would cause a positional imaging offset.
- Power Interruption. The X-axis shaft/head assembly can gradually move to the right when power to the printer or motor is interrupted prior to doing a parking move. This occurs because the thread pitch slope is steep enough to allow the gear to rotate if unchecked by motor resistance. Home position is lost when this happens but the printer re-homes when the power is cycled.

Removal

1. Remove the right cover.
2. Remove the left cover. Disconnect the head-tilt spring.
3. Disconnect the X-axis motor wiring harness at the X-axis motor.

4. Remove the two screws securing the X-axis motor and bracket in place.

5. Rotate the black, plastic retainer counter-clockwise.

6. Lift up on the bottom portion of the X-axis drive yoke. Lift up on the yoke and remove the upper portion of the yoke.

7. Remove the nose cone from the gear.

8. Rotate the X-axis gear counter-clockwise to remove it from the X-axis shaft.

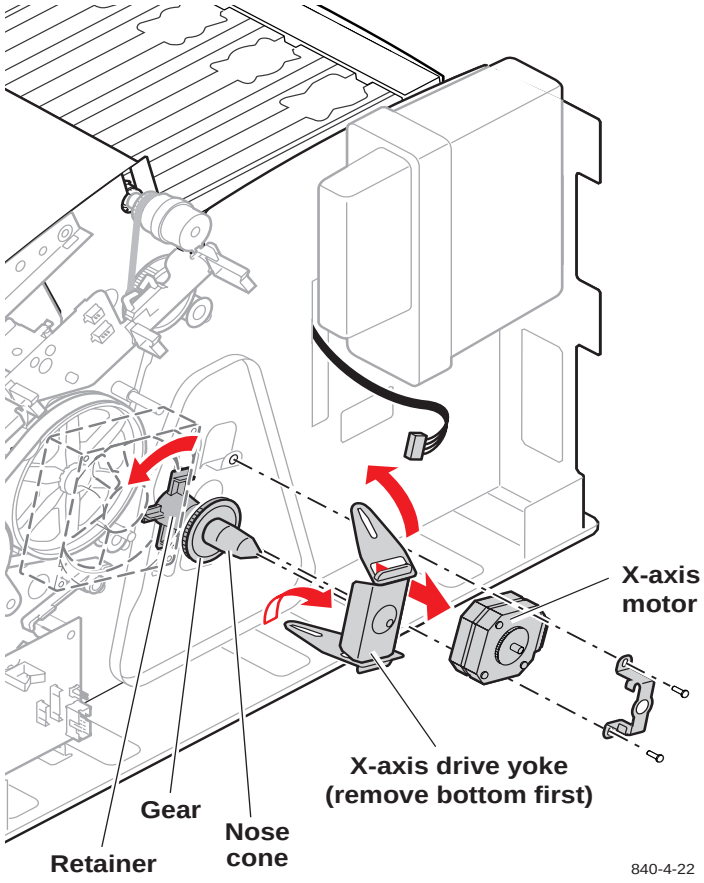


Figure 6-22. Removing the X-axis Motor and Drive Assembly

Reassembly of the X-axis Motor and Drive Assembly

For reassembly, apply a *small* amount of grease on the tip of the nose cone. Apply a *small* amount, 3 dabs, on the threads of the X-axis shaft. Be sure to rotate the black, plastic retainer so it ends locks the yoke in position. Perform the procedure " X-axis scale adjustment."

CAUTION

When reinstalling the motor, take care to fully seat the motor positioning boss into the stiffener panel for proper operation.

1. Place the retainer over the leadscrew. Orient it so that the flat side faces generally toward the motor.
2. Put lubrication on the leadscrew and screw the threaded gear—longer hub facing out. Turn it all the way on (clamped against the stop collar) then back off 1/4 turn.

NOTE: The X-axis shaft/head assembly will be spring loaded but should otherwise be free to travel.

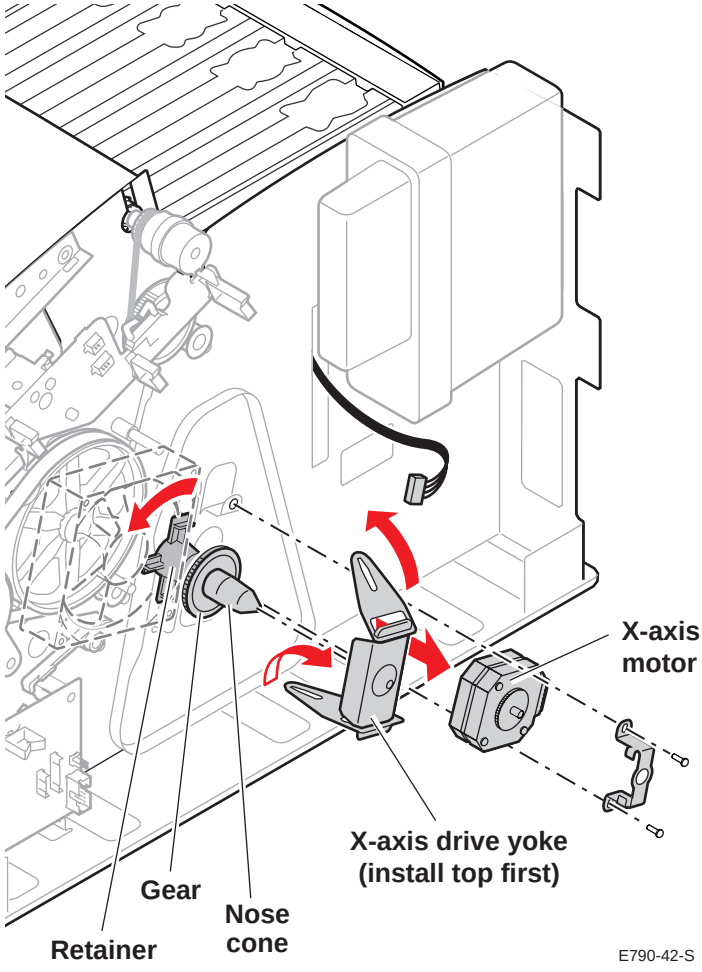


Figure 6-23. Installing the X-axis Motor and Drive Assembly

3. Install the upper yoke leg by hooking it into the stiffener tab: pivot toward the side frame until it hooks then pivot back out. Installing the yoke legs requires orienting the stop collar to allow access to the tabs.

4. Clean the mating surfaces of the gear hub and nose cone (diameter and base) then slip the nose cone over the gear hub.

5. Lubricate the yoke pocket.

6. Engage the yoke span and the un-mounted yoke leg by rotating the end tabs of the span to fit through the large rectangular hole of the leg. Orient so the parts are coupled perpendicular to one another.
7. Insert the free span end of this assembly into the upper leg opening and orient to couple them. Take case not to wipe lubricant out of the span. The pocket should only come into contact with the end of the nose cone.
8. Rotate the yoke assembly downward over the nose cone and latch the lower leg to the stiffener tab. Rotate the stop collar as required to permit attachment of the leg during this installation.
9. Install the X-axis motor. Take care to fully seat the motor positioning boss into the stiffener panel.
10. Install the motor bracket
11. Connect the X-axis motor wiring harness.
12. Perform the X-axis Scale Adjustment procedure.

Y-axis Belt Drive Assembly

1. Remove the right cover.
2. Disconnect the wiring harness leading from the front panel to the right I/O board passing beside the Y-axis belt drive assembly.
3. Remove the drum fan.

CAUTION

Never loosen or remove the three screws securing the assembly parts together.

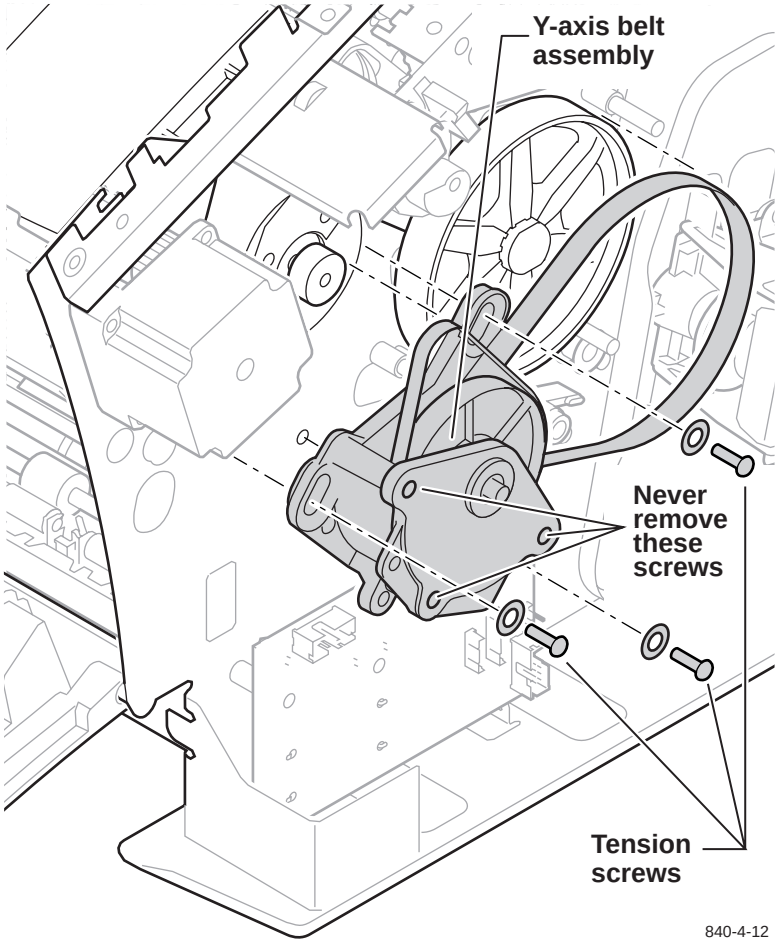


Figure 6-24. Removing the Y-axis Belt Drive Assembly

4. Remove the three tension set screws securing the Y-axis belt drive assembly to the engine frame. Remove the assembly with its two belts.

NOTE: Tension the drive belts using the procedure, "Y-axis belts tension adjustment."

Reverse these steps to install the Y-axis belt drive assembly.

Y-axis (Drum) Motor and Process Motor

1. Remove the right cover.
2. Remove the left cover.
3. Remove the front panel.
4. Remove the drum maintenance drawer.
5. If you are removing the Y-axis motor, remove the Y-axis belt drive assembly.
6. Remove the upper feed roller assembly.
7. Remove the paper/drum heater.
8. Remove the four screws securing either motor to the drum/transfix assembly. Remove the motor. Unclip the cable ties retaining the motor's wiring harness.

Reverse these steps to install the Y-axis or process motor.

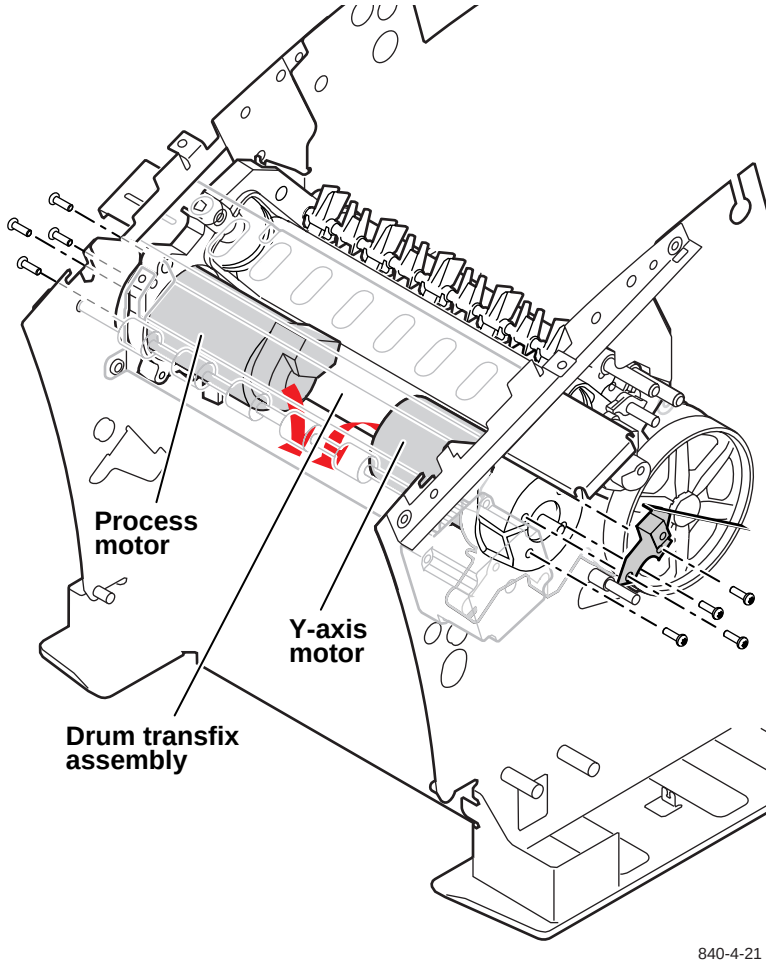


Figure 6-25. Y-axis (Drum) Motor and Process Motor

Removing the Paper Path Motor

1. Remove the right cover.
2. Disconnect the paper path motor wiring harness from the power control board. Free its wiring harness from the cable restraints.
3. Remove the three screws securing the paper path motor in place. Remove the motor.

Reverse these steps to reinstall the paper path motor.

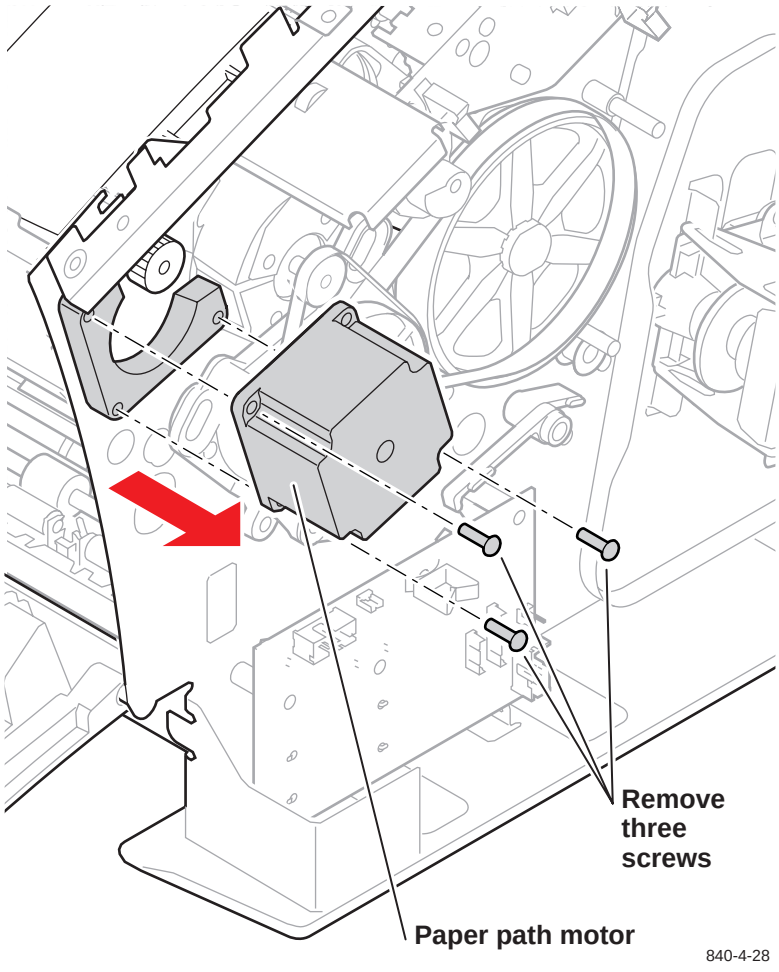


Figure 6-26. Removing the Paper Path Motor

Cap/Wipe/Purge Assembly

WARNING

Even when the printer is turned off, AC line voltages may be present at the printer heaters while the printer is plugged into AC power.

1. Remove the right cover.
2. Remove the left cover.
3. Disconnect the head-tilt spring. Tilt back the printhead and center it.
4. Remove the top cover.
5. Remove the ink loader.
6. Disconnect the wiring harness leading from the cap/wipe/purge assembly to the power supply wiring harness. Clip the tie wraps and disconnect the vacuum hose leading to the vacuum/pump module.
7. Rotate the cap wipe drive gear to position the cap/wipe/purge assembly 25 mm (1 in.) from the top of its travel.
8. Place a few sheets of paper between the drum and the cap/wipe/purge assembly to prevent scratching the drum.
9. Remove the right timing belt's lower pulley to create slack in the right timing belt.
10. Remove the metal vacuum line from the assembly.
11. Remove the wiring from the right cap/wipe/purge assembly bracket.
12. Push the wiring through the print engine's frame so that you can unloop it from the cap/wipe/purge assembly.
13. While holding onto the cap/wipe/purge assembly, remove the three pin screws that hold the cap/wipe/purge assembly in the grooves on each side of the print engine.

Reverse these steps to reinstall the cap/wipe/purge assembly. Refer to the wiring diagrams in Appendix C for details on dressing the cap/wipe/purge wiring.

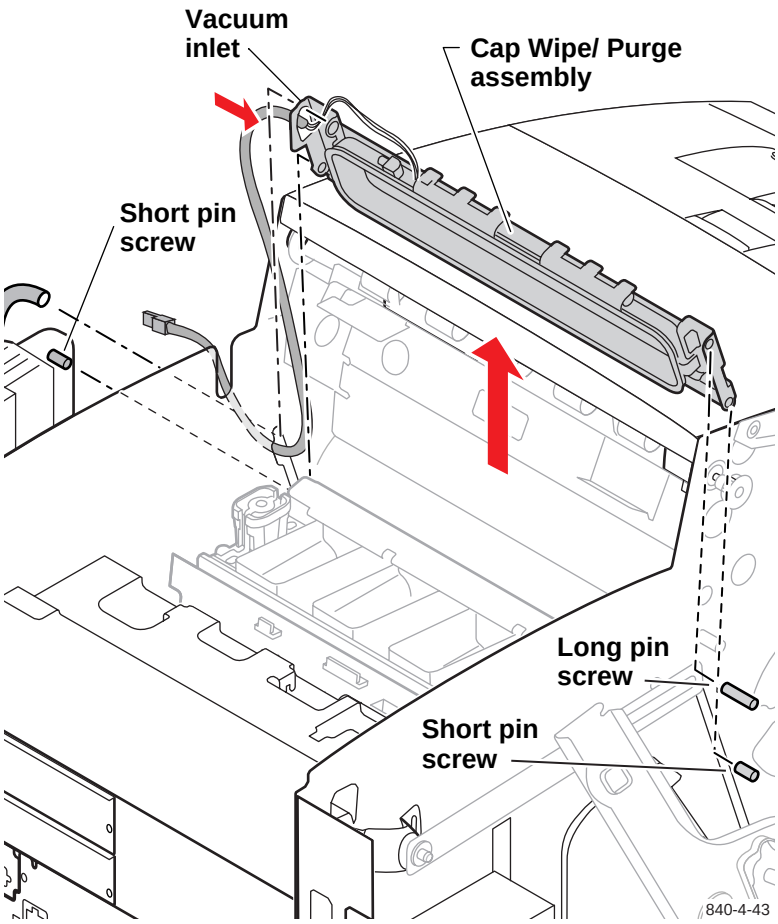


Figure 6-27. Removing the Cap/Wipe/Purge Assembly

Removing Cap/Wipe/Purge Belts

1. Remove the right, left and top covers.
2. Disconnect the head-tilt spring. Tilt back the printhead.
3. Remove the ink loader.
4. Manually rotate the cap/wipe/purge drive enough to raise the cap/wipe/purge assembly so the two belt locks are accessible on left and right side of the printer frame.

5. At the right side of the printer, slide the metal vacuum hose out of the cap/wipe/ purge unit.

6. Unlatch the timing belt lock of each belt to free each belt.

When installing new belts, reverse these steps and attach each belt so that the pointer on each belt lock points at the index mark on the printer side frames. Tighten each lock to its fourth tooth as illustrated. Perform the belt alignment adjustment using procedure in Chapter 4 to ensure the belts are aligned and that the cap/wipe/purge assembly will correctly seal against the printhead faceplate.

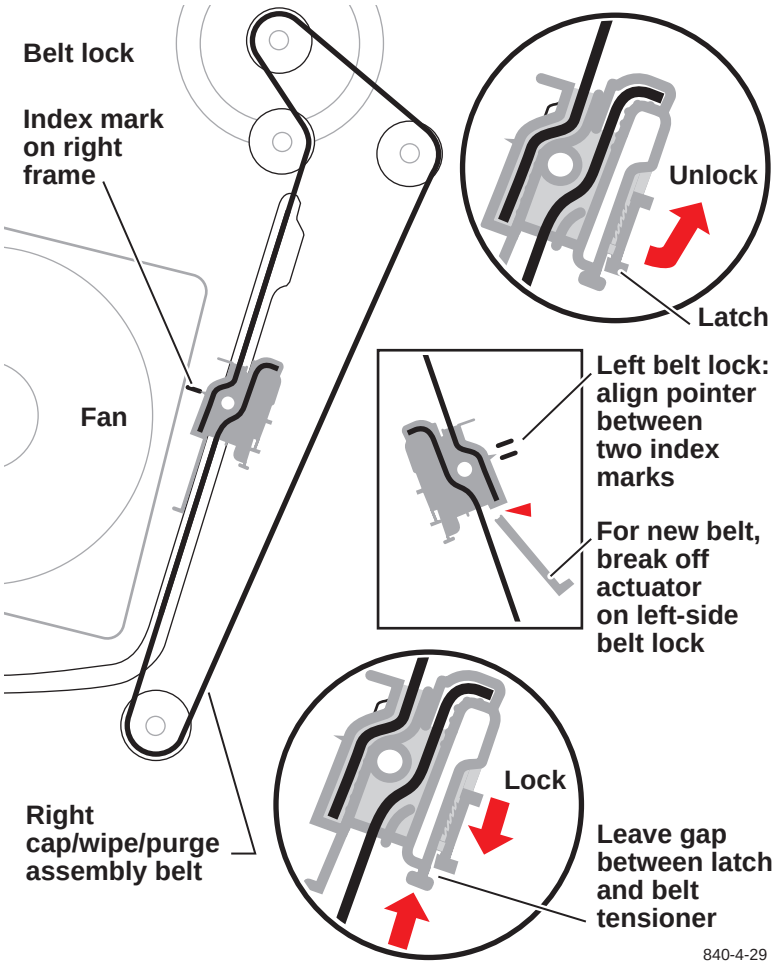


Figure 6-28. Removing Cap/Wipe/Purge Timing Belts

Removing Stripper Finger Assemblies

1. Remove the right, left and top covers.
2. Upper stripper finger assembly. At the right side of the printer, remove the transfix solenoid bracket.
3. Remove the cutting screw securing the right end of the upper stripper finger assembly to the printer frame. Remove the upper stripper finger assembly.
4. Lower stripper finger. At the right side of the printer, remove the C-clips securing the spring unit in place. Remove the spring unit, spring and bushing.
5. At the left side of the printer, remove the C-clip securing the left end of the lower stripper finger assembly. Carefully remove the bushing and lower stripper finger without damaging the dust cover underneath.

Reverse these steps to install the stripper finger assemblies.

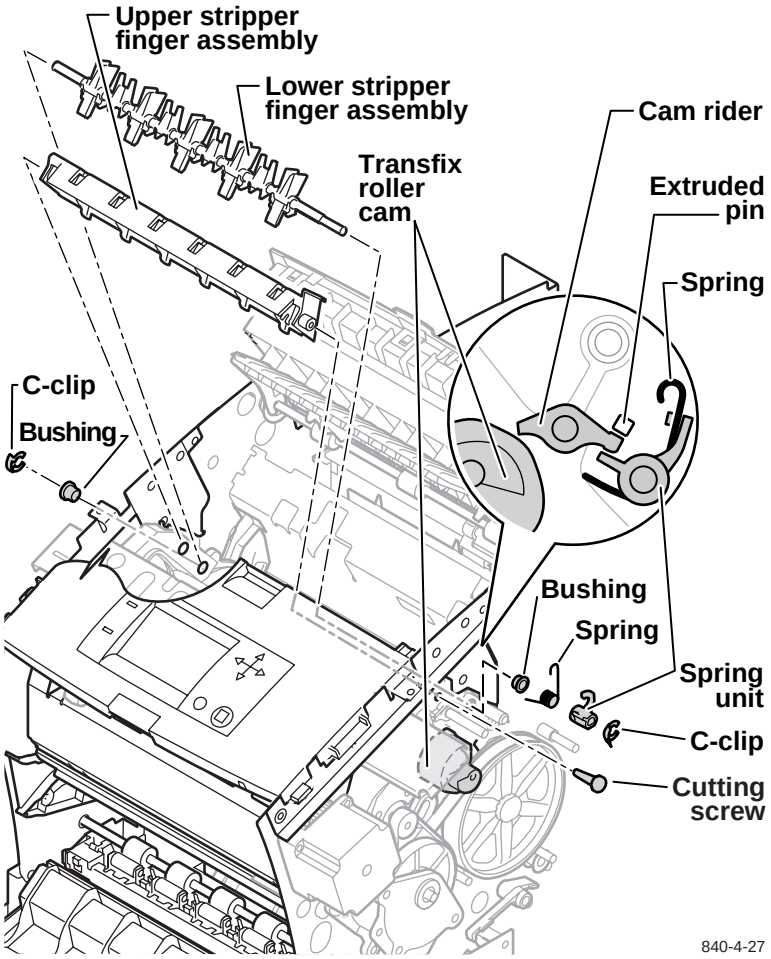


Figure 6-29. Removing Stripper Finger Assemblies

Removing the Maintenance Cam Roller and Electric Clutch

1. Remove the right cover.
2. Remove the left cover.
3. Disconnect the maintenance cam roller electric clutches wiring harness from the left I/O board.
4. At the left side of the printer, remove the C-clip securing the maintenance cam roller electric clutch. Remove the clutch.

5. Remove the right I/O board.
6. At the right side of the printer, use a small, flatblade screwdriver to unlock the maintenance cam roller flag from the end of the maintenance cam roller.
7. Inside the left-side printer frame, remove the C-clip securing the maintenance cam roller in place. Remove the maintenance cam roller.

Reverse these steps to install the maintenance cam roller and electric clutch.

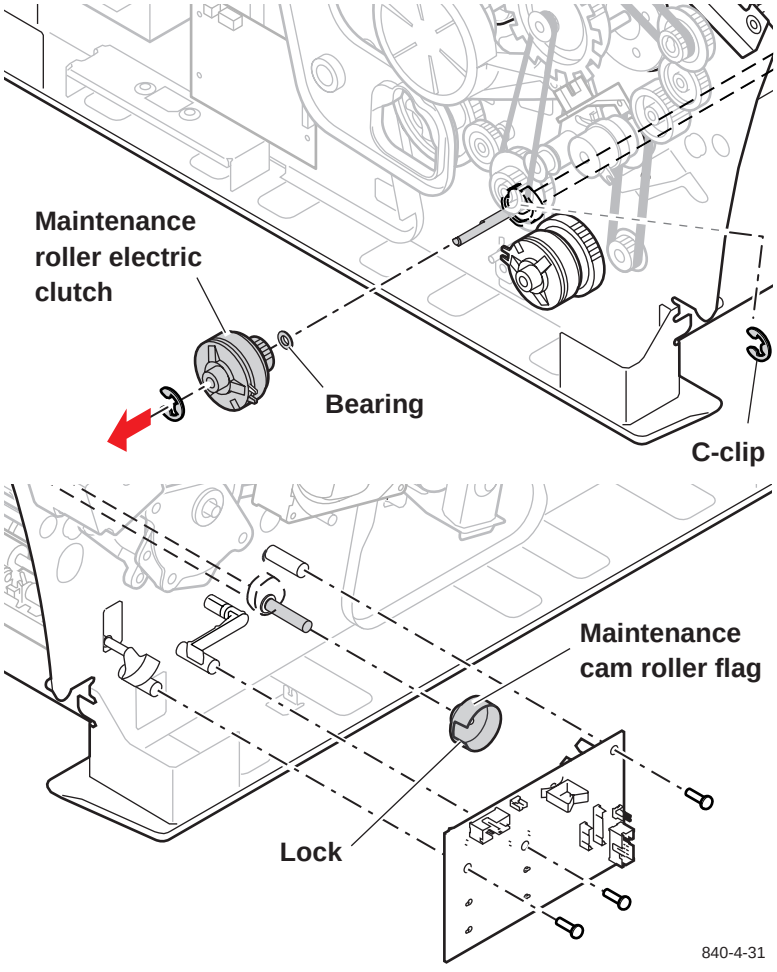


Figure 6-30. Removing Maintenance Cam Roller and Electric Clutch

Removing Maintenance Drawer Counter Connector Assembly

WARNING

Allow the printer to cool for 30 minutes.

1. Remove the right, left and top covers.
2. Remove the ink loader.
3. Remove the maintenance drawer.
4. Disconnect the maintenance drawer counter connector assembly's wiring harness from the power control board.
5. Reach in through the maintenance drawer cavity and squeeze the snap-fit maintenance drawer counter connector assembly to free it from the printer frame. Carefully remove it and its wiring harness.

Reverse these steps to install the maintenance drawer counter connector assembly.

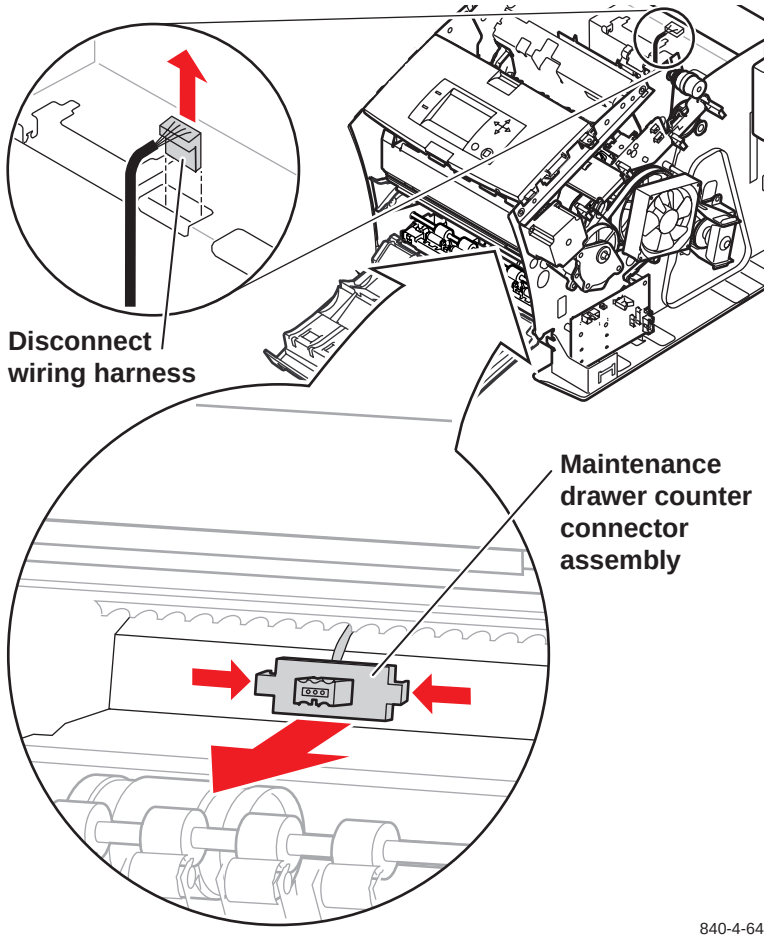


Figure 6-31. Removing Maintenance Drawer Counter Connector Assembly

Removing Preheater Exit Sensor

WARNING

Allow the printer to cool for 30 minutes.

1. Remove the right, left and front covers.
2. Remove the upper feed roller assembly.
3. Remove the paper/drum heater.
4. Disconnect the preheater exit sensor wiring harness from the J170 of the left I/O board.

CAUTION

Be careful in the next step not to scratch or mar the drum.

5. Remove the screw securing the preheater exit sensor to the inside of the left drum/ transfix assembly frame. Remove the sensor and its wiring harness.

Reverse these steps to install the preheater exit sensor.

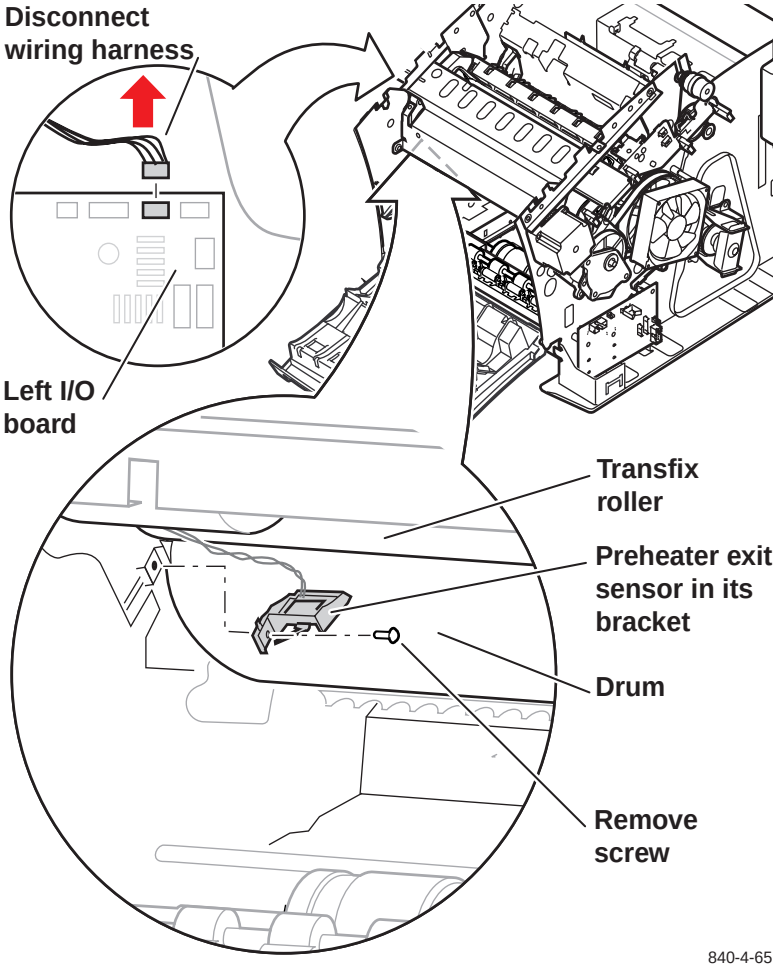


Figure 6-32. Removing the Preheater Exit Sensor

Removing the Drum Temperature Sensor

1. Remove the right cover,
2. Remove the left cover.
3. Remove the top cover.
4. Remove the ink loader.
5. Unplug the drum temperature sensor from the left I/O board.
6. Remove the screw securing the drum temperature sensor to the printer frame. Carefully remove the sensor.

Reverse these steps to install the drum temperature sensor.

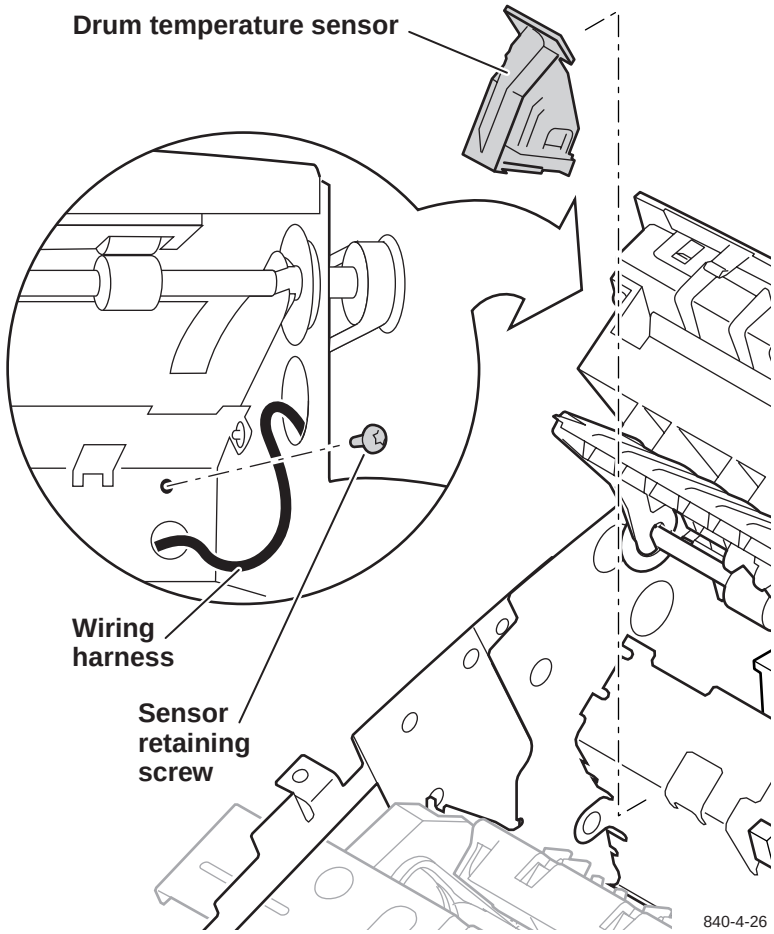


Figure 6-33. Removing Drum Temperature Sensor

Installing RAM DIMMs

The printer accepts two SDRAM DIMMs which are 64 Mbyte in size. The printer recognizes any acceptable size SDRAM DIMM in any RAM DIMM slot. Use the following steps to installing new RAM DIMMs.

1. Power down the printer. Leave the power cord plugged in to provide a ground path for static discharges.
2. Loosen the two rear panel screws securing the main board. Slide out the main board.
3. To release an installed RAM DIMM, spread the latches securing each end of the DIMM in the connector.

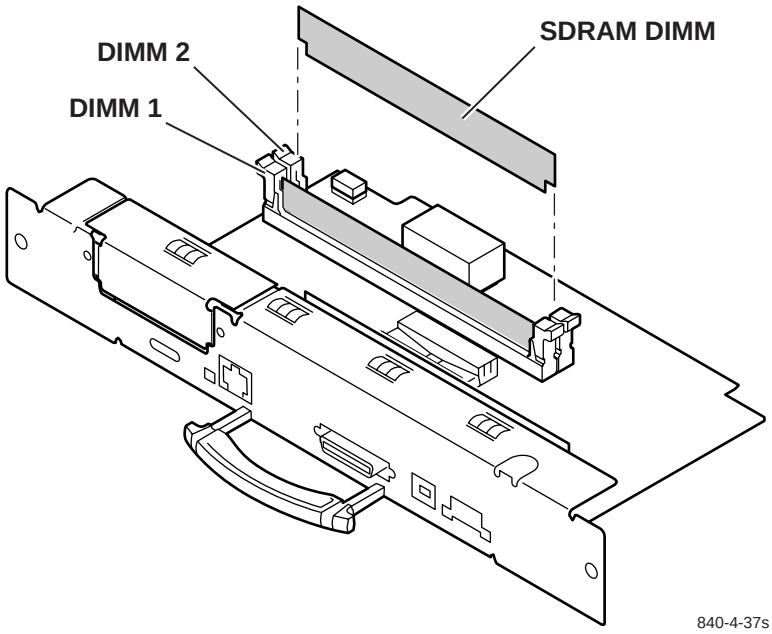


Figure 6-34. Locating RAM DIMMs

4. To install a RAM DIMM in the keyed DIMM connector, insert the DIMM until it locks in place. When properly inserted, a tab on each end of the connector slips into a notch on each end of the RAM DIMM.
5. Reinstall the main board into the printer.
6. Reconnect the host interface cables. Turn on the printer and print the start page to verify the memory installation.

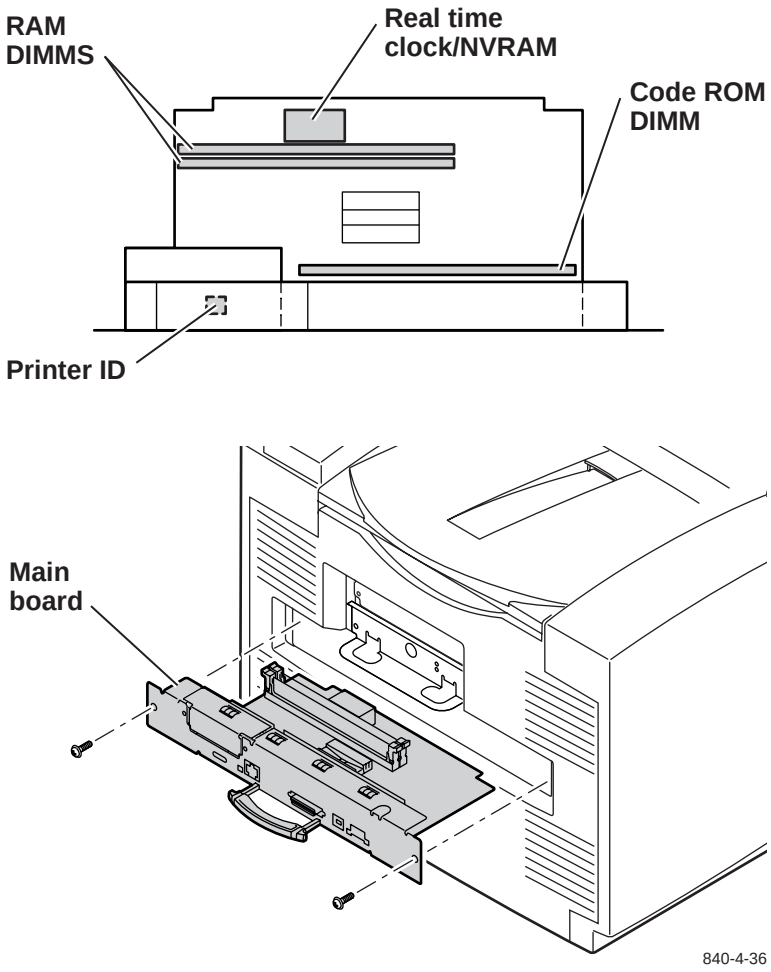


Figure 6-35. Installing RAM DIMMs

Installing the Code ROM DIMM

The code ROM DIMM contains both print engine and PostScript firmware. Use the following steps to resinstall the Code ROM DIMM

1. Power down the printer. Leave the power cord plugged in to provide a ground path for static discharges.
2. Loosen the two rear panel screws securing the main board. Slide out the main board.
3. To release an installed code ROM DIMM, spread the latches securing each end of the DIMM in the connector.

4. To install the code ROM in the keyed DIMM connector, insert the DIMM until it locks in place. When properly inserted, a tab on each end of the connector slips into a notch on each end of the ROM DIMM.

5. Reinstall the main board into the printer.

6. Reconnect the host interface cables. Turn on the printer and make a test print.

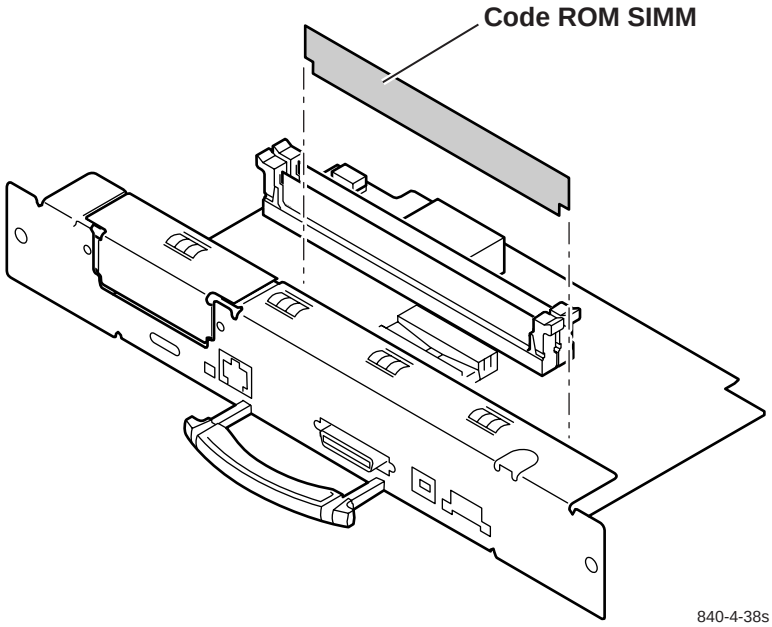


Figure 6-36. Installing Code ROM DIMM

Installing the Optional Ethernet Network Card

1. Power down the printer. Leave the power cord plugged in to provide a ground path for static discharges. Remove the interface cable.
2. Loosen the two securing screws holding the network card or the cover plate and remove it.
3. Slide in the replacement network card and tighten the two screws.
4. Reconnect the interface cables. Turn on the printer and print the configuration page; it lists information regarding the Ethernet interface.
5. For installations of a new Ethernet card, affix the Ethernet address label to the underside of the top cover where it can easily be accessed. *Also apply a "Do not use" sticker over the 10baseT Ethernet port on the main board.* The built-in Ethernet port is disabled by the presence of an Ethernet network card.

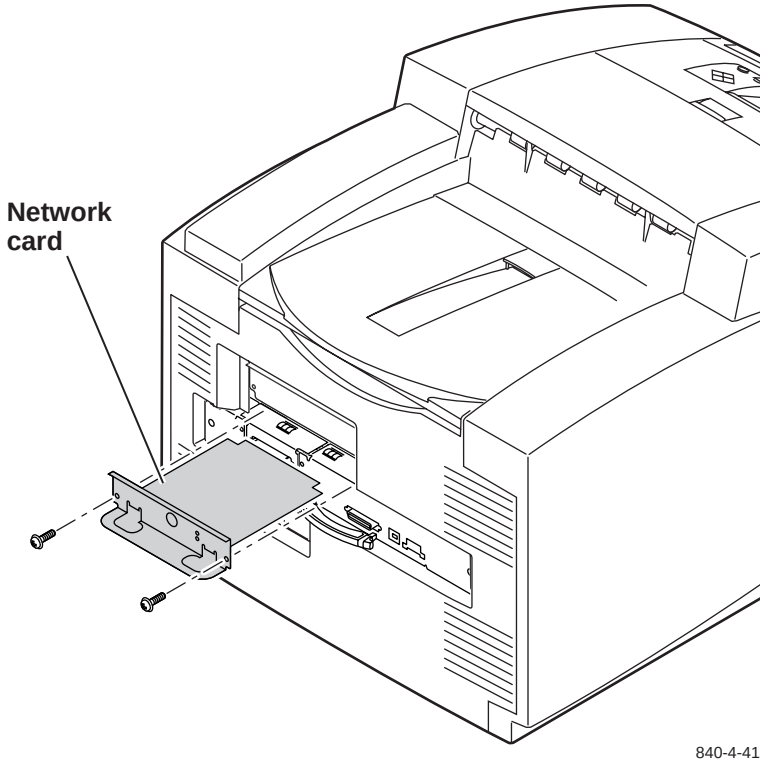


Figure 6-37. Installing Network Card

Installing the Internal Hard Drive

1. Power down the printer. Leave the power cord plugged in to provide a ground path for static discharges.
2. Remove the network card or the network card slot cover plate, whichever is in place.
3. Loosen the two securing screws holding the internal hard drive or cover plate and remove it.
4. Slide in the replacement internal hard drive and tighten the two screws.
5. Reinstall the network card or the network card slot cover plate, whichever was removed earlier.
6. Turn on the printer and print the configuration page; it lists information regarding the internal hard drive.

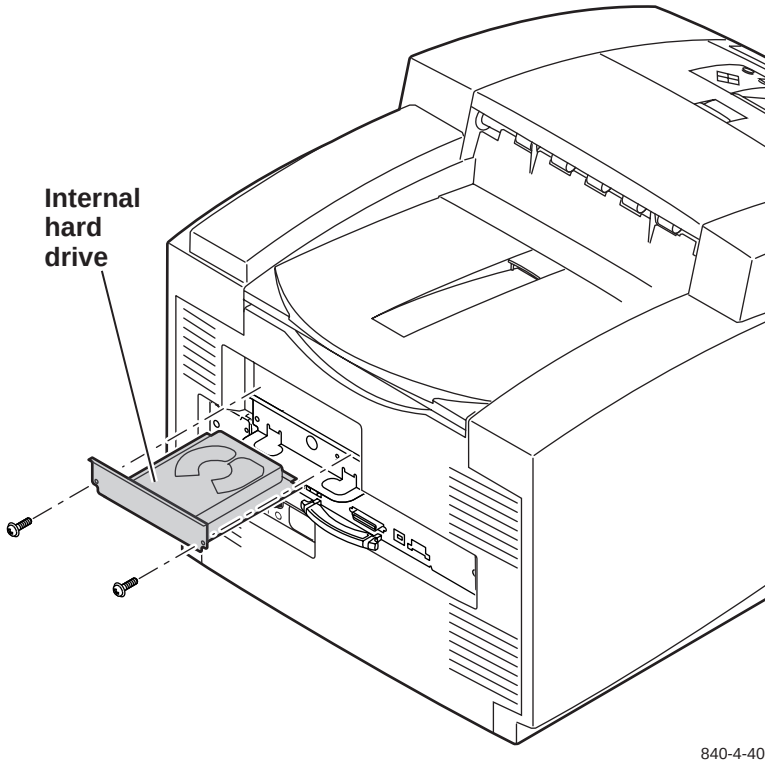


Figure 6-38. Installing Internal Hard Drive

Upgrading Software

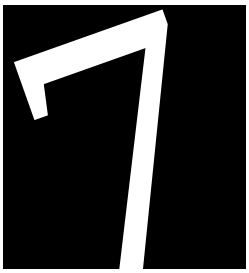
The operating system of the Solid Inkjet 100 printer is capable of reprogramming the embedded software using flash memory technology. When instructed to flash, the OS overlays a special boot program, the flash monitor, onto RAM and reboots the processor. The flash monitor then boots and downloads a formatted data stream containing executable object code into the flash ROM. After completing the flash, the monitor reinstalls the nominal boot program.

The main value of this functionality is found during printer development, when software changes are applied daily. To support daily flashing, the OS spawns a daemon that listens for a remote flash request. A flash instruction can also be initiated from the OS command shell using `flash()`. Either of these mechanisms load the flash monitor described above. The formatted data stream is received remotely, via the network or parallel port.

However, when the printer is booted in Customer Mode, the flash daemon is not active because the Ethernet connection that services the OS is disabled. The only available Ethernet pathway into the printer is attached to the PostScript Interpreter. It is useful to retain the ability to download the embedded software remotely, in part because it simplifies upgrades in the field. Thus the PostScript language has been extended to permit remote flashing during any boot mode.

The custom operator updateflash is used to download the formatted data stream used by the flash monitor into the frame buffer RAM. The flash monitor is then booted and programs the flash ROM using the data stream supplied not remotely, but locally from RAM. If the attempt to flash from RAM subsequently fails, the monitor reboots itself and expects data to be supplied remotely.

Chapter



Chapter 7

Printer Networking

This guide provides information to help you quickly install the *ii* LINX™ Solid Inkjet 100 Printer in the following environments:

- Mac® OS (EtherTalk)
- Windows® 95 and Windows® 98
- Windows NT®
- Novell® NetWare®

The accompanying CD-ROM also contains NWSET for printer configuration on NetWare networks. The README file for NWSET is in the net_util folder under Netware.

The Solid Inkjet 100 printer can also be interfaced to an *ii*LINX Network running version 2.8.1 software or higher; or a DICOM Print Server (DPS) running version 1.3 software or higher. Reference the appropriate installation documentation for these interfaces.

Before You Begin Network Configuration

- Set up your printer and physcially connect it to the network. See the *iiLINX Solid Inkjet 100 User Manual* for information about setting up the printer.
- Install the Solid Inkjet 100 driver for your printer on every Macintosh and PC that will send print jobs to the printer. For details on driver installation, see "Installing Printer Software" in the *iiLINX Solid Inkjet 100 User Manual*.
- For NetWare environments. To speed the setup process and avoid conflicts, familiarize yourself with the components of your network. You should know which version(s) of NetWare are installed, which versions of client software are used, and the network topology (e.g., frame types, routers, hubs, and cabling).

Printing a Configuration Page

Your printer's Configuration Page supplies useful information for installing and configuring the printer on a network.

Printing a Configuration Page

1. When the front panel displays `READY TO PRINT`, press the down-arrow button until **Menu** is highlighted. Press the **Select** button.
2. Press the down-arrow button until **Demo and Test Pages** is highlighted. Press the **Select** button.
3. Press the down-arrow button until **Print Configuration Page** is highlighted. Press the **Select** button.

Setting the Printer's IP Addressing Parameters

In order to install the printer in a network environment, obtain the information listed in Table 3-1. It might be helpful to write down this information so you can refer to it during the configuration procedure.

CAUTION

To avoid any network conflicts, contact your system administrator for the appropriate IP address settings.

Table 7-1. Information for TCP/IP Configuration

Information	Comments
Internet (IP) address for the printer	Format is x.x.x.x, where x represents a decimal number from 0–255.
Network mask	If you are unsure, leave this blank; the printer will choose an appropriate mask.
Broadcast address	If you are unsure, leave this blank; the printer computes an appropriate broadcast address.
	The address the printer uses to **send** broadcast packets. Regardless of how this parameter is set, the printer **accepts** broadcast packets from any of the commonly used broadcast address conventions.
Gateway IP address	Router address. You need this address if you want to communicate with the printer from anywhere other than the local network segment.

Setting IP Parameters from the Front Panel

1. When the front panel displays `READY TO PRINT`, press the down-arrow button until **Menu** is highlighted. Press the **Select** button.
2. Press the down-arrow button until Network Settings is highlighted. Press the **Select** button.
3. Press the down-arrow button until **TCP/IP** is highlighted. Press the **Select** button.
4. Set the IP address:
    a. Press the down-arrow button until **IP Address** is highlighted. Press the **Select** button.
    b. Press the left- or right-arrow buttons to highlight the 3-digit part of the address that you want to set. Press the up- or down-arrow keys to change the numbers.
    c. When the address is set, press the **Select** button.
5. Set the network mask:
    a. Press the down-arrow button until **Network Mask** is highlighted. Press the **Select** button.
    b. Press the left- or right-arrow buttons to highlight the 3-digit part of the address that you want to set. Press the up- or down-arrow keys to change the numbers.
    c. When the address is set, press the **Select** button.
6. Set the default router/gateway address:
    a. Press the down-arrow button until **Default Router/Gateway Address** is highlighted. Press the **Select** button.
    b. Press the left- or right-arrow buttons to highlight the 3-digit part of the address that you want to set. Press the up- or down-arrow keys to change the numbers.
    c. When the address is set, press the **Select** button.
7. To return the printer to normal operation, press the down-arrow button until **Exit** is highlighted. Press the **Select** button.
8. Press **Reset Printer**. All the information changes will take effect after the printer resets.

Setting IP Parameters—DHCP

Dynamic Host Configuration Protocol (DHCP) is a system in which Windows NT servers can allocate IP addresses dynamically. Under DHCP, the server gives the printer (called a DHCP client) an IP address when the printer is reset.

1. When the front panel displays `READY TO PRINT`, press the down-arrow button until **Menu** is highlighted. Press the **Select** button.
2. Press the down-arrow button until **Network Settings** is highlighted. Press the **Select** button.
3. Press the down-arrow button until **TCP/IP** is highlighted. Press the **Select** button.
4. Press the down-arrow button until **DHCP/BOOTP** is highlighted. Press the **Select** button to toggle the function on (or off).
5. Press the down-arrow button until **Exit** is highlighted. Press the **Select** button.
6. In order to turn on the DHCP/BOOTP interface, highlight **Reset Printer Now**. Press the **Select** button.

You must reset the printer to turn on the DHCP/BOOTP interface. The reset will take approximately 2 minutes to complete. The printer will automatically print a Startup Page to confirm that the function is on.

DHCP Transactions

- On power up or reset, the printer sends a *DHCP discover packet*, indicating its Ethernet address and requesting an IP address.
- The DHCP server responds to the discover packet with a *DHCP offer packet*, which contains an IP address from within the assigned scope and the assigned lease.
- The printer examines the DHCP offer packet and decides whether to accept the lease. The printer sends a *request packet*, accepting the IP address and the lease.

NOTE: There can be multiple DHCP servers on the same network, each defining its own scopes and leases. The printer selects the first lease offered.

- The DHCP server sends an *acknowledgment packet* to the printer, which completes the transaction.

Ethernet® Interface

Built-in Ethernet® Connector

The printer's built-in Ethernet® connector has the following connections and indicators:

1. LINK indicator—*on* indicates a working connection to a hub; *off* indicates no connection to a hub.
2. RCV indicator (green)—*blinks* while the network interface is receiving.
3. XMT indicator (yellow)—*blinks* while the network interface is transmitting.
4. Twisted pair (10Base-T) connector.

PhaserShare® Series B Ethernet® Interface

The PhaserShare® Series B Ethernet interface conforms to the IEEE 802.3 and Ethernet II standards. With the printer's built-in Ethernet interface, you can connect the printer directly to an Ethernet network using twisted pair (10Base-T) cables. With the optional Ethernet interface card, you can connect the printer directly to an Ethernet network using twisted pair cables (10Base-T or 100Base-Tx or 10Base-2).

When an optional Ethernet interface card is installed, the printer's built-in Ethernet connector is disabled; use the connectors on the card.

When an optional Ethernet interface card is purchased as an upgrade kit, follow the instructions that are shipped with the card.

CAUTION

To avoid damaging the network interface, turn off the printer before making any Ethernet connections.

Optional Ethernet® Interface Card

The optional Ethernet interface card (Figure 7-1) has the following connections and indicators:

1. TX indicator (yellow)—*blinks* while the network interface is transmitting.
2. RX Link indicator (green)—*blinks* while the network interface is receiving.
3. Speed indicator (yellow)—*on* indicates 100 Mbps; *off* indicates 10 Mbps.
4. Twisted pair connection indicator—*on* indicates a working connection to a hub; *off* indicates no connection to a hub. If the 10Base-2 connector is used, this indicator is *off*.
5. Twisted pair (10Base-T or 100Base-Tx) connector.
6. Thin coax (10Base-2) connector.

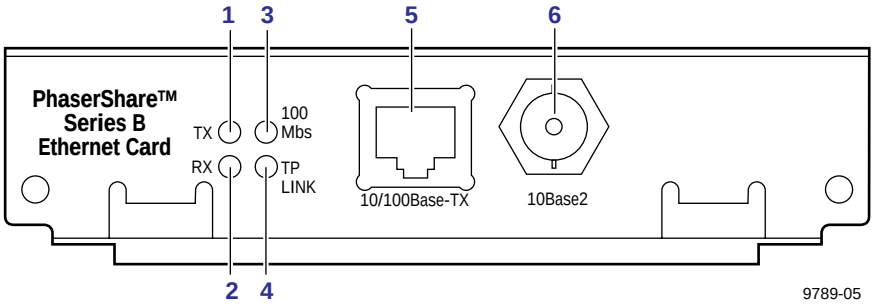


Figure 7-1. Optional Ethernet® Interface Card

Ethernet® Cables and Termination

NOTE: To fully comply with EMI (electro-magnetic interference) specifications, the use of shielded or screened cables may be required. "Shielded" describes IBM-defined cables used with the DB-9 connector. "Screened" describes cables that are electrically similar to Category 4 UTP (Unshielded Twisted Pair), but with an added shield or screen.

10Base-T or 100Base-Tx (Twisted Pair)

100Base-Tx requires Category 5 (100-Ohm UTP) cabling.

CAUTION

Do not use "silver satin" telephone extension cables for 10Base-T networks, either as drop cords or as patch cables in the wiring closet. (Silver satin cables are flat, usually silver or gray, with 28-gauge stranded or tinsel conductors.) Do not use shielded twisted pair cable intended for IBM Token Ring networks or voice-grade (level 1 or 2) unshielded twisted pair cable for wiring runs. *These cables do not meet the requirements for 10Base-T and will lead to unreliable operation.*

Mac® OS: Ethertalk Configuration

NOTE: The printer's AppleTalk connection works with Macintosh System software 7.0, 7.1, 7.5, 7.6, 8.0, 8.1, and 8.5.

Finding the Printer's Name in the Chooser

1. From the Apple menu, select **Chooser**.
2. In the left-hand side of the **Chooser**, find the LaserWriter 8 icon. (If the LaserWriter 8 icon is not in the **Chooser**, you need to install the printer driver.) Click on the LaserWriter 8 icon.

NOTE: To install a Solid Inkjet 100 Printer driver on a Macintosh network (via Ethertalk), refer to "Installing Printer Software" in Chapter 2 under "Macintosh Software".

3. If a list of zones appears in the lower-left portion of the **Chooser**, select the proper zone.
4. A list of printers appears in the right portion of the **Chooser**; find your printer's name. The printer's default name is listed on the Configuration Page (see "Printing a Configuration Page" earlier in this chapter). If the name does not appear, check the cable connection between your printer and the network.

*NOTE: It is possible for the **Printer Name** field on the Configuration Page to be blank. When the printer is powered up, it uses a default name and then checks to see that no other printer on the network has the same name. If enough printers with the same default name are present, it can take several minutes for the printer to establish a unique name. If the **Printer Name** field on the Configuration Page is blank, wait a short time and reprint the Configuration Page.*

Novell® NetWare® Configuration

Using the Quick Configuration Wizard

Log On to the File Server

NOTE: Many of the operations performed using the PhaserShare Administrator require SUPERVISOR privileges (for example, creating queues).

- **NetWare 3.x**. Log on to the default NetWare file server as SUPERVISOR or SUPERVISOR equivalent.
- **NetWare 4.x, Bindery mode**. Log on to the default NetWare file server as SUPERVISOR, SUPERVISOR equivalent, or ADMIN /B.
- **NetWare 4.x, NDS (NetWare Directory Services) mode**. Log on to the default NetWare file server as ADMIN or ADMIN equivalent.

NOTE: While not required, it is recommended that you log in only to the file servers to be configured with this printer.

Start the PhaserShare® Administrator

Double-click the **PhaserShare Administrator** icon. Refer to your Windows documentation for complete information on how to start applications.

When you start the PhaserShare Administrator, the Main window is displayed.

Select a Print Server

In the Main window Printer List, click the print server name/printer name.

NOTE: If the printer is not in the list of available printers, there could be a network hardware problem, an incorrect frame type, or incorrect search options settings. Contact your Sterling Service Representative.

Launch the Quick Configuration Wizard

Click **Quick Configuration** to launch the Quick Configuration Wizard.

Configure the Printer and Set Up Queues

1. If desired, change the Print Server Name or Printer Name.
2. Select connection mode(s) by checking the box(es) for Bindery Services, NDS Services, or both.
3. Click **Next**; the dialogs that follow allow you to configure Bindery connections, NDS connections, or both. You need to supply the following information for these connections:

Information Needed for Bindery Connections

Select either the configuration file server or the preferred file server from the drop-down list; click Next.

If the file server you want is not on the list, proceed with these steps:

1. Click **File Servers** to display the File Servers Browse dialog box.
2. Select the server you want. Click **OK**. You are returned to the File Server Selection dialog box.
3. Select either the configuration file server or the preferred file server from the drop-down list. Click **Next**.

Create and select a new queue, or select an existing queue. Click **Finish**.

Information Needed for NDS Connections

- Specify the current **Directory Services Tree** (the tree where the print server will reside).
- Specify the current **Directory Services Context** (the location in the directory services tree where the print server will reside).
- Create and select a new queue, or select an existing queue. Click **Finish**.

Verify Information and Finish the Configuration

After you have entered the configuration information, the Quick Configuration Wizard displays the Configured Printer Information dialog box, which reports the information you have entered.

1. Verify that the information is correct.
    - If the information is correct, click **Apply Changes**.
    - If the information is not correct, click **Back** to return to previous dialog boxes and correct the information. Click **Next** to return to the **Configured Printer Information** dialog box. Click **Apply Changes**.
    - To exit the wizard and return to the **Main** window without making any changes, click **Cancel**.
2. After you click **Apply Changes**, the printer resets; the changes take effect when the reset is complete.
3. After the reset, you are prompted to print a Test Page. It is recommended that you print a Test Page to verify a successful installation.

Setting IPX Frame Types from the Front Panel

1. When the front panel displays `READY TO PRINT`, press the down-arrow button until **Menu** is highlighted. Press the **Select** button.
2. Press the down-arrow button until **Network Settings** is highlighted. Press the **Select** button.
3. Press the down-arrow button until **NetWare** is highlighted. Press the **Select** button.
4. Press the down-arrow button until **IPX Frame Type** is highlighted. Press the **Select** button.
5. Press the down-arrow button until the desired frame type is highlighted. Press the **Select** button until **On** is displayed. If desired, you can set more than one frame type.
6. To return the printer to normal operation, press the down-arrow button until **Exit** is highlighted. Press the **Select** button.

TCP/IP Configuration for a PC

If you do not already have a TCP/IP address configured for your PC, contact your system administrator to ensure that the configuration is made according to your company guidelines. If there is no TCP/IP network already in place, configure your PC with a unique address such as 192.1.1.1. To check the IP address for your PC, follow these steps:

1. From the **Start** menu, click **Run**.
2. Enter:

   `winipcfg`
3. Click **OK**.
4. Choose your network adapter from the pulldown list.
5. The IP address is listed in the **IP Address** field.

For more information on installing and configuring TCP/IP in Windows environments, see your Microsoft Windows documentation.

Setting the Printer's IP Address

NOTE: To avoid any network conflicts, contact your System Administrator for the appropriate IP Address, Network Mask, and Router/Gateway Address.

You can set the printer IP address by accessing the printer's front panel. For more information, see "Setting the Printer's IP Addressing Parameters."

PhaserPort™ Software Installation

1. Insert the printer's software CD-ROM into the CD-ROM drive.
2. Double-click on **My Computer**. Double-click on the **CD-ROM drive** icon.
3. Double-click on the folder **phsrport**.
4. Double-click on the **phsrport.exe** icon.
5. Click **OK** to the **WinZip Self-Extractor** window.

6. Click **Unzip** in the **WinZip Self-Extractor** window (this will copy the program files to your hard drive).
7. Click **OK** when the files have successfully unzipped.
8. When the **Tektronix PhaserPort Setup** screen comes up, click **Next**.
9. When the **Tektronix PhaserPort Installation** screen comes up, click **Next**.
10. When the **Choose Destination Location** screen comes up, click **Next**.

Create Your First Port

1. When the **Add PhaserPort** dialog box is displayed, create your first port:
    a. In the **Description** field, enter a name for the port (this can be the printer name/model, location, or any other descriptive name of your choice), such as **SIJ100**.
    b. Use the **Tab** key to move to the **DNS Name/Address** field.
    c. In the **DNS Name/Address** field, enter the printer's IP address (for example, 192.1.1.2). Click **OK**.

NOTE: The printer must be on the network and powered on for PhaserPort software to detect it and complete installation.

NOTE: If you do not know the printer's IP address, contact your system administrator.

2. At the **Finish Installation** screen, click **Next**.

    The installer will automatically run the **Add Printer Wizard**, which allows you to install the driver for the Solid Inkjet 100. The drivers are located on your printer's CD-ROM.

    - If you have **not** already installed the printer driver, go to "Install the Driver" following this section.
    - If you have already installed the printer driver, click **Cancel** at the **Finish Installation** screen. Then go to **Adding a port to an existing printer**.

Install the Driver

1. In the **Add Printer Wizard**, click **Next**. Choose **Local printer**, the click **Next**.
2. The **Manufacturers and Printers** dialog box is displayed. Click **Have Disk**.
3. From the **Install From Disk** dialog box, type:

   d:\ (where d is the CD-ROM drive). Click **OK**.
4. Select the **Sterling iiLINX Solid Inkjet 100**. Click **Next**.
5. If prompted that a driver is already installed for this printer, select **Keep existing driver (recommended)**. Click **Next**.
6. In the **Available ports** list, select the port you created during the first part of the installation (**PhaserPortv2.1.0.0**). Click **Next**.
7. In the **Printer name** dialog box, give the printer a unique name if another Sterling *ii*LINX Solid Inkjet 100 is installed (for example: SIJ100-Network)
8. At the Setup Complete screen, select (**Yes, I want to restart my computer now**).

Your computer will now close all applications and perform a restart. Your driver will now be ready for use.

Adding a Port to an Existing Printer

Use this procedure to add/change a port for a printer when you have already installed the driver.

1. Select your printer driver:
   a. From the **Start** menu, select **Settings**.
   b. From the **Settings** menu, select **Printers**.
   c. In the **Printers** window, right-mouse click your printer driver (**iiLINX Solid Inkjet 100**).
2. From the pop-up menu, choose **Properties**.
3. When the properties dialog for the printer is displayed, click **Details**.

4. Highlight **PhaserPort** and click **OK**; this displays the A**dd PhaserPort** dialog.

    a. In the **Description** field, enter a name for the port (this can be the printer name/model, location, or any other descriptive name of your choice), such as **SIJ100-Network**.

    b. In the **Name/Address** field, enter the IP address of the printer (for example 192.1.1.2), and click **OK**.

NOTE: If you do not know the printer's IP address, contact your system administrator.

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5. Click **OK** again to apply the changes; the printer driver is now configured to use your new **PhaserPort**.

Windows NT®

The procedures in this chapter is only valid for Windows NT version 4.0 or higher.

Setting the Printer's IP Address

Set the printer's IP address by any of the methods described earlier in this chapter in, "Setting the Printer's IP Addressing Parameters."

The Windows NT 4.0 PostScript driver is a PPD-based driver. Follow these instructions to add or update the Solid Inkjet 100 PPD file for use with Windows NT 4.x. This update procedure provides printer page-size information for Windows NT applications. These instructions assume a basic familiarity with Windows NT operation and terminology. For additional information about Windows NT, refer to your Microsoft Windows NT documentation.

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*NOTE: You may need the Windows NT 4.x CD-ROM and your printer's software CD-ROM to complete this procedure. In order to successfully install the Windows NT Solid Inkjet 100 driver, the Windows NT Administrator **MUST** install the **Microsoft TCP/IP Printing Service** and the **TCP/IP protocol**.*

Creating Network Port Configuration

The Solid Inkjet printers support two types of network ports:

- LPR
- AppleTalk

The following procedure covers LPR ports; for information on AppleTalk ports, refer to "Creating an AppleTalk Port" following this section.

Creating LPR Printing

Adding an LPR port:

1. Click on **Start**, **Settings**, and **Printers**.
2. In the **Printers** dialog box, double-click **Add Printer**.
3. Select **My Computer** and click **Next**.
4. If the printer is connected to the network, click **Add Port**.
5. Double-click **LPR Port** in the **Printer Ports** dialog box (if the **LPR Port** is not available, contact your Windows NT Administrator).
6. In the **Add LPR compatible printer** dialog box, enter the printer's IP address in the box labeled **Name or address of server providing lpd**. In the box labeled **Name of printer or print queue on that server**, enter PS (in uppercase). Click **OK**.
7. When returned to the **Printer Ports** box, click **Close**.
8. At the **Add Printer Wizard** dialog box, click the box next to this new port; a check mark is added. Click **Next**.

Installing the Printer Driver:

9. In the **Add Printer Wizard** dialog box, click **Have Disk** to add a new Solid Inkjet 100.
10. Type the path name to the driver files. This can be:

    d:\ (or the current location of your CD-ROM drive). Click **OK**.
11. Select the **Sterling iiLINX Solid Inkjet 100**. Click **Next**.
12. If prompted that a driver is already installed for this printer, select **Keep existing driver (recommended)**. Click **Next**.

If the printer driver does not exist, go to Step 14.

13. In the **Printer name** dialog box, give the printer a unique name if another Sterling *ii*LINX Solid Inkjet 100 is installed (for example: SIJ100-Network).

14. Select **Not shared**, and click **Next**.
15. If you want to print a Test page, select **Yes**, and click **Finish**.

Creating an AppleTalk Port

Adding an AppleTalk Port:

1. Click on **Start**, **Settings**, and **Printers**.
2. In the **Printers** dialog box, double-click **Add Printer**.
3. Select **My Computer** and click **Next**.
4. If the printer is connected to the network, click **Add Port**.
5. Double-click **AppleTalk Printing Devices** in the **Printer Ports** dialog box (if the **AppleTalk Printing Devices** is not available, contact your Windows NT Administrator).
6. Windows will now search for AppleTalk Printers (this may take a few minutes). When your printer appears in the **Available AppleTalk Printing Devices**, click on the printer name and click **OK**.
7. At the prompt, **Do you want to capture this AppleTalk printing device?**, click **No**.
8. When returned to the **Printer Ports** box, click **Close**.
9. At the **Add Printer Wizard** dialog box, click the box next to this new port which will add a check mark. Click **Next**.

Installing the printer driver:

10. In the **Add Printer Wizard** dialog box, click **Have Disk** to add a new Solid Inkjet 100.
11. Type the path name to the driver files. This can be:

    `d:\` (or the current location of your CD-ROM drive). Click **OK**.
12. Select the **Sterling iiLINX Solid Inkjet 100**. Click **Next**.
13. If prompted that a driver is already installed for this printer, select **Keep existing driver (recommended)**. Click **Next**.

If the printer driver does not exist, go to Step 15.

14. In the **Printer name** dialog box, give the printer a unique name if another Sterling *ii*LINX Solid Inkjet 100 is installed (for example: SIJ100-AppleTalk).
15. Select **Not shared**, and click **Next**.
16. If you want to print a Test page, select **Yes**, and click **Finish**.

NOTE: For network installation/configuration, see the iiLINX Solid Inkjet 100 User Manual.

Windows® 95 Procedure

1. Before you begin, make all physical connections from the PC to the Solid Inkjet 100 to allow the printer to be recognized as a new hardware device.
2. Reboot your PC. The **New Hardware Found** screen will appear briefly. Click **Next**.

*NOTE: If the **New Hardware Found** screen does not appear, use the "Add Printer Procedures Windows 95/98 (Optional Method)" procedure later in this chapter.*

3. Insert the CD-ROM containing the Solid Inkjet 100 Printer driver software.
4. Select **Driver from disk provided by hardware manufacturer** option. Click **OK**.
5. The **Install from Disk** screen will appear. Type:

   d:\ (or the appropriate drive for your CD-ROM in the copy manufacturers files box). Click **OK**.

The printer is now installed.

Windows® 98 Procedure

1. Before you begin, make all physical connections from the PC to the Solid Inkjet 100 to allow the printer to be recognized as a new hardware device
2. Reboot your PC. The **New Hardware Found** screen will appear briefly. Click **Next**.

*NOTE: If the **New Hardware Found** screen does not appear, use the procedure in "Add Printer Procedures Windows 95/98 (Optional Method)" following this section.*

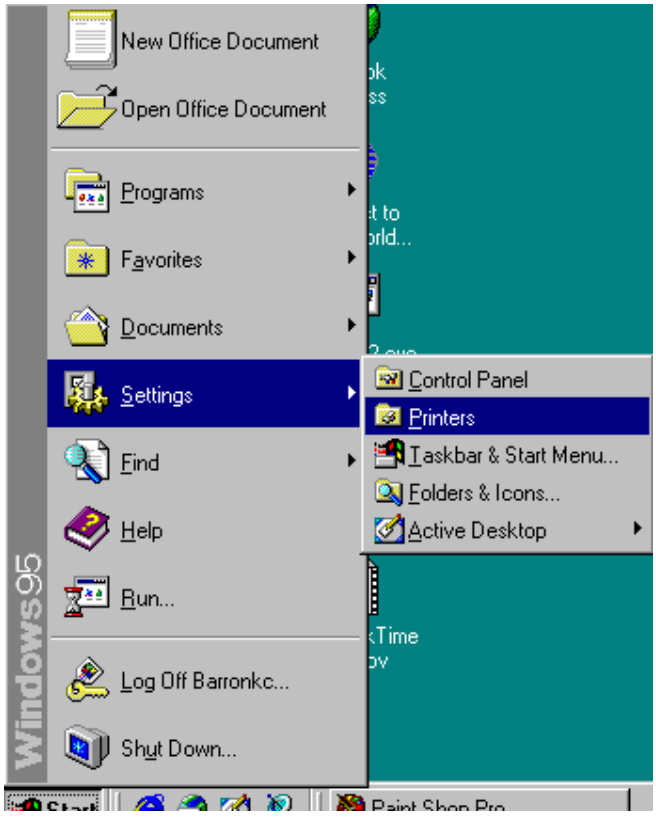
3. Insert the CD-ROM containing the Solid Inkjet 100 Printer driver software

4. Click on **Have Disk**.
5. The **Install from Disk** screen will appear. Type:

   d:\ (or the appropriate drive for your CD-ROM in the copy manufacturer's files box). Click **OK**.
6. The **Sterling iiLINX SIJ 100** will appear. Click **Next**.
7. Click **Next** again.
8. Click **Finish**.

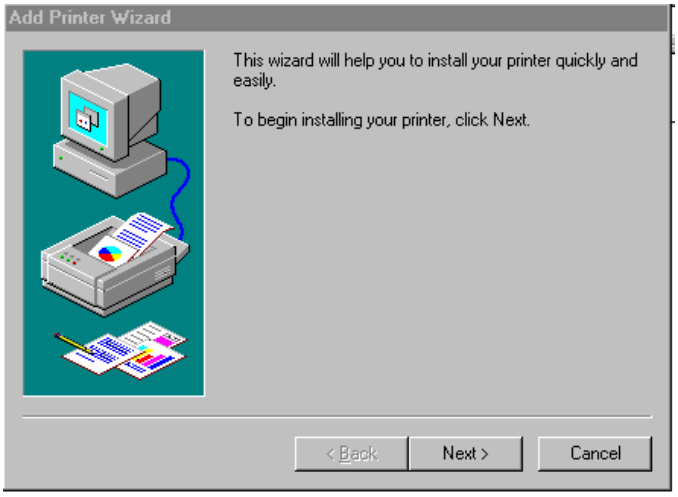
Add Printer Procedure Windows® 95/98 (Optional Method)

1. From the Windows Start Menu, select **Settings, Printers**.

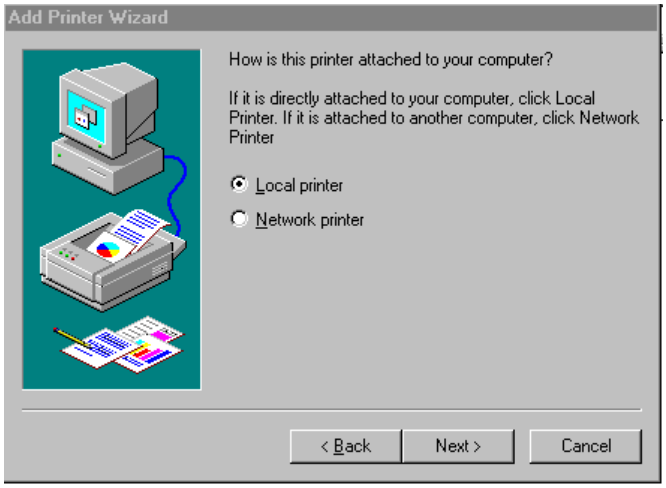


2. Double click on **Add Printer**.

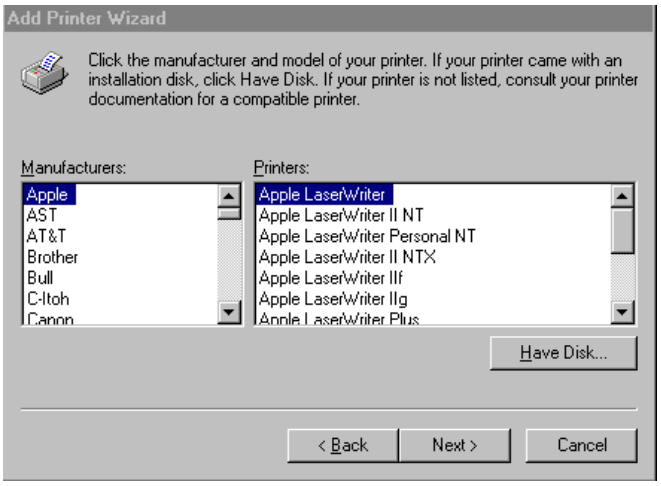
3. The **Add Printer Wizard** screen should appear. Click **Next**.


Add Printer Wizard
This wizard will help you to install your printer quickly and easily.
To begin installing your printer, click Next.
< Back
Next >
Cancel

4. Select **Local printer**. Click **Next**.

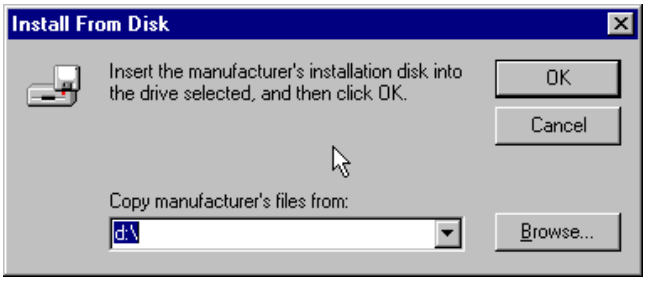

Add Printer Wizard
How is this printer attached to your computer?
If it is directly attached to your computer, click Local Printer. If it is attached to another computer, click Network Printer
Local printer
Network printer
< Back
Next >
Cancel

5. Insert the device drivers CD-ROM into the CD-ROM drive and select **Have Disk**.

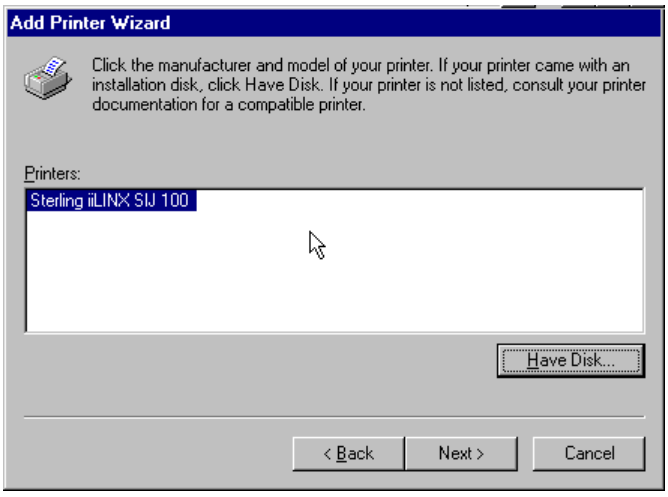


6. The **Install from Disk** screen will appear. Type:

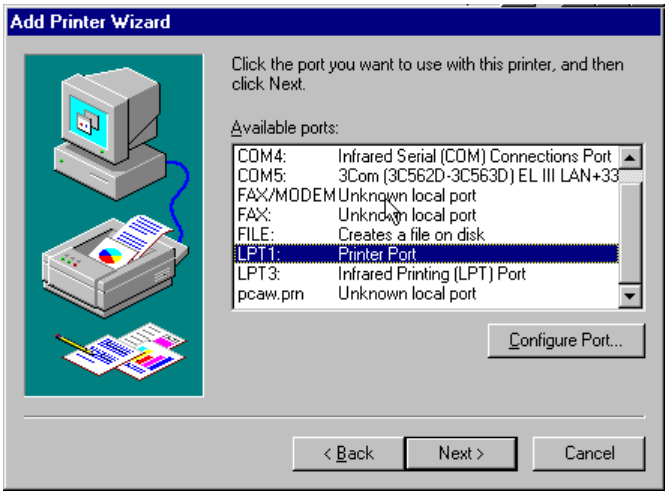
   d:\ (or the appropriate drive for your CD-ROM in the copy manufacturer's files box). Click **OK**.



7. The **Sterling iiLINX SIJ 100** Printer selection will appear. Click **Next**.


Add Printer Wizard
Click the manufacturer and model of your printer. If your printer came with an installation disk, click Have Disk. If your printer is not listed, consult your printer documentation for a compatible printer.
Printers:
Sterling iiLINX SIJ 100
Have Disk...
< Back
Next >
Cancel

8. Click on the port you want to use with the printer. (For local parallel port printing, use LPT1.) Click **Next**.


Add Printer Wizard
Click the port you want to use with this printer, and then click Next.
Available ports:
COM4: Infrared Serial (COM) Connections Port
COM5: 3Com (3C562D-3C563D) EL III LAN+33
FAX/MODEM Unknown local port
FAX: Unknown local port
FILE: Creates a file on disk
LPT1: Printer Port
LPT3: Infrared Printing (LPT) Port
pcaw.prn Unknown local port
Configure Port...
< Back
Next >
Cancel

9. You can type a name for the printer or use the default name. You can also select the printer as a default printer if desired. Click **Finish**.

Windows NT® 4.0 Procedure

1. Before you begin, make all physical connections from the PC to the Solid Inkjet 100 to allow the printer to be recognized as a new hardware device.
2. Reboot your PC. The **New Hardware Found** screen will appear briefly. Click **Next**.

*NOTE: If the **New Hardware Found** screen does not appear, use the procedures in "Add Printer Procedures (Optional Method)" following this section.*

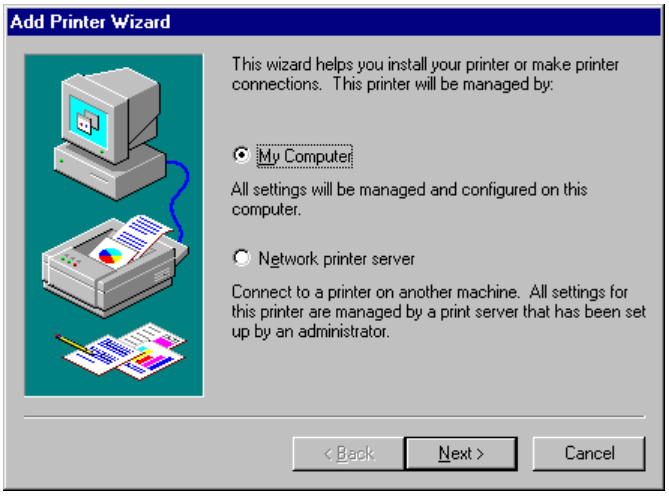
3. Insert the CD-ROM containing the Solid Inkjet 100 Printer driver software.
4. Select **Driver from disk provided by hardware manufacturer** option. Click **OK**.
5. The **Install from disk** screen will appear. Type:

   d:\ (or the appropriate drive for your CD-ROM in the copy manufacturers files box). Click **OK**.

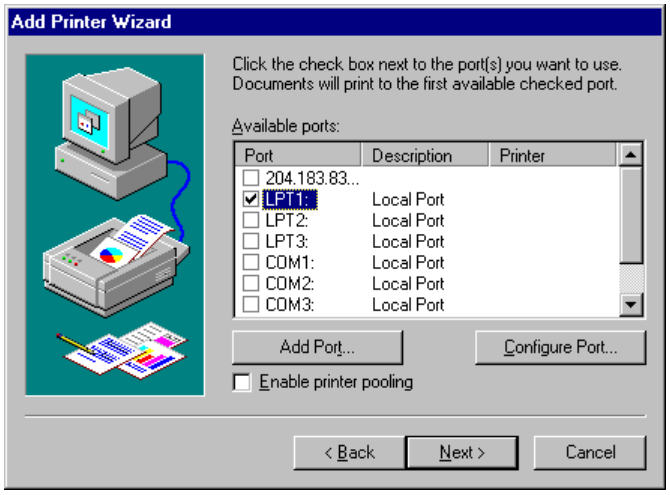
The printer is now installed.

Add Printer Procedure (Optional Method)

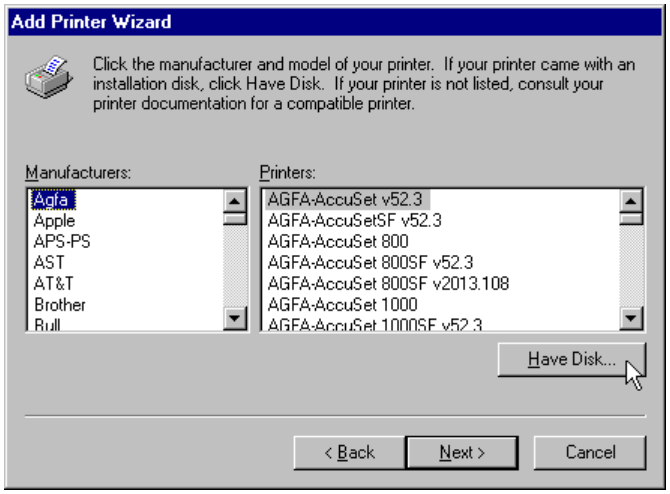
1. From the Windows Start Menu, Select **Settings, Printers**.
2. Double-click on **Add Printer**.
3. The **Add Printer Wizard** screen will appear. Select **My Computer** and click **Next**.


Add Printer Wizard
This wizard helps you install your printer or make printer connections. This printer will be managed by:
My Computer
All settings will be managed and configured on this computer.
Network printer server
Connect to a printer on another machine. All settings for this printer are managed by a print server that has been set up by an administrator.
< Back
Next >
Cancel

4. Select the box labeled **LPT1** (local port) and click **Next**.

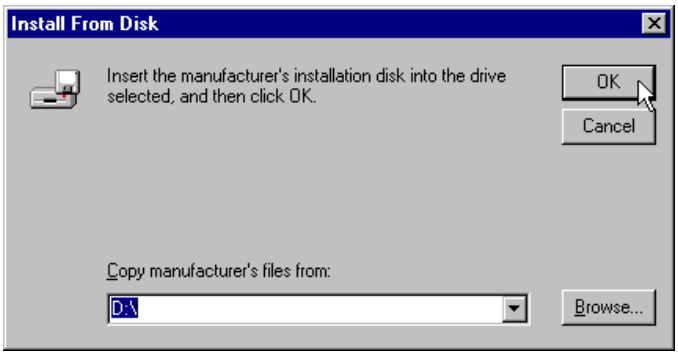


5. Insert the device drivers CD-ROM into the CD-ROM drive and select **Have Disk**.

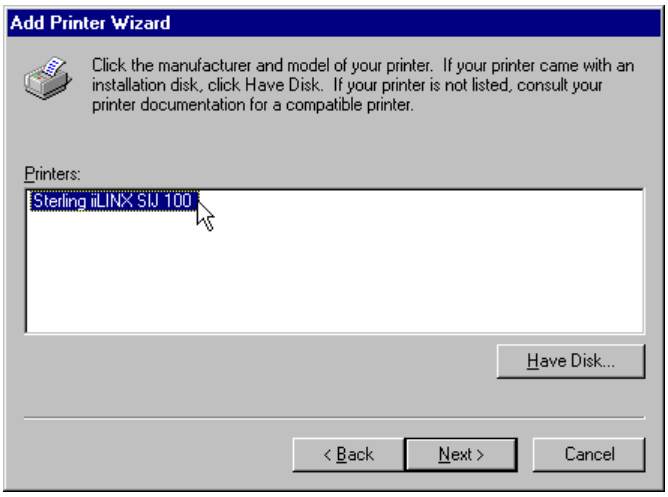


6. The **Install from Disk** screen will appear. Type:

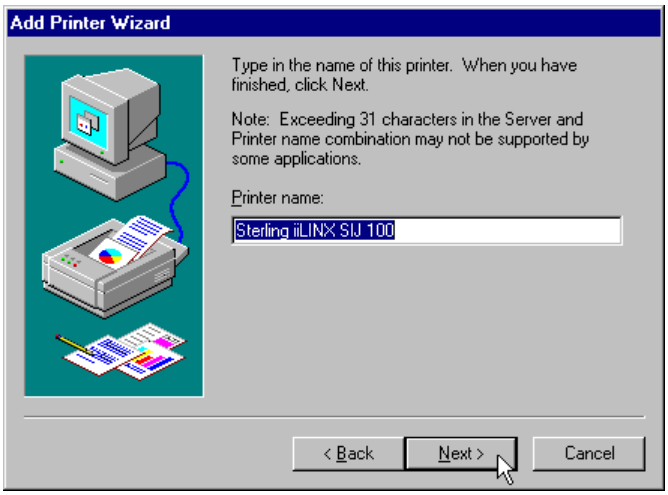
   d:\ (or the appropriate drive for your CD-ROM in the copy manufacturer's files box). Click **OK**.



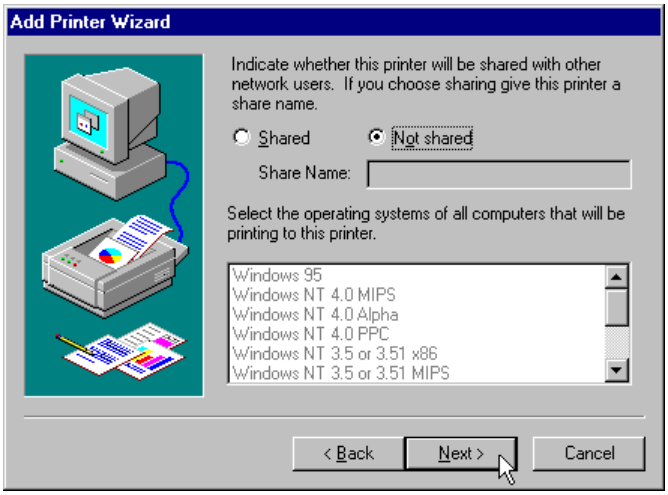
7. Highlight the **Sterling iiLINX SIJ100** printer selection, click **Next**.


Add Printer Wizard
Click the manufacturer and model of your printer. If your printer came with an installation disk, click Have Disk. If your printer is not listed, consult your printer documentation for a compatible printer.
Printers:
Sterling iiLINX SIJ 100
Have Disk...
< Back
Next >
Cancel

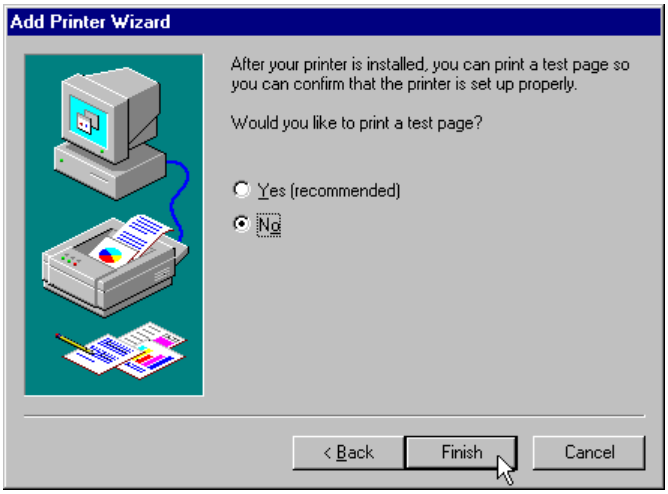
8. Type in the name of the printer, then click **Next**.


Add Printer Wizard
Type in the name of this printer. When you have finished, click Next.
Note: Exceeding 31 characters in the Server and Printer name combination may not be supported by some applications.
Printer name:
Sterling iiLINX SIJ 100
< Back
Next >
Cancel

9. Select **Not Shared**, then click **Next**.


Add Printer Wizard
Indicate whether this printer will be shared with other network users. If you choose sharing give this printer a share name.
Shared
Not shared
Share Name:
Select the operating systems of all computers that will be printing to this printer.
Windows 95
Windows NT 4.0 MIPS
Windows NT 4.0 Alpha
Windows NT 4.0 PPC
Windows NT 3.5 or 3.51 x86
Windows NT 3.5 or 3.51 MIPS
< Back
Next >
Cancel

10. Click **Finish**. The Printer should now be installed. You can print a test page for verification.


Add Printer Wizard
After your printer is installed, you can print a test page so you can confirm that the printer is set up properly.
Would you like to print a test page?
Yes (recommended)
No
< Back
Finish
Cancel

Macintosh® Software

Install

1. Insert the printer's CD-ROM.
2. Double-click on the installer and follow the online instructions.

Set Up the Driver

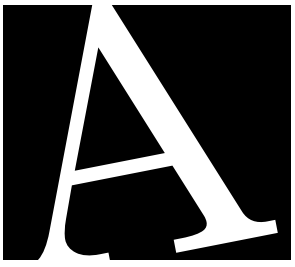
1. From the Apple menu, select **Chooser**.
2. Click the icon of the printer driver (LaserWriter 8) on the left side of the window.
3. Click the Zone for your printer, if applicable.
4. From the list of printers on the right side of the window, select your printer. If it is not in the list, check the hardware connections and verify that you have selected the correct zone in the Chooser on the left side of the window.
5. Click **Setup/Create** to select the correct PostScript Printer Description (PPD) file.
6. After the automatic setup has completed, click **Setup** and click **Configure**.
7. Select the options that are installed in your printer (for example, memory configuration, Auxiliary Feeder, or internal hard drive); this information can be found on the Startup page. Setting up the driver allows you to select all printer options when printing.
8. Click **OK**.
9. Close the Chooser.

Enabling EtherTalk

The EtherTalk network protocol is enabled from the front panel as follows:

1. Allow the printer to warm up to its idle, “Ready to Print” state.
2. Scroll to the selection Menu and press the **Select** button.
3. Scroll to the selection Network Settings and press the **Select** button.
4. Scroll to the toggle item Ethertalk. The current setting (On or Off) is displayed to the right.
5. Press the **Select** button to toggle the current setting for EtherTalk. The display will reflect the new setting.

Appendix



Appendix A

Material Number Listings

Illustrated Parts Catalog A-3
Service Tools A-22
Supplies and Accessories A-23

Illustrated Parts Catalog

This section provides parts listings and exploded view illustrations of field-replaceable units for the Solid Inkjet 100 Printer.

Table A-1. Cabinet parts

Item Number	Part Number	Serial Number Effective/ Discontinued	Qty	Name and Description
1	200-4366-00		1	Right cover
2	200-4257-00		1	Front cover, jam access door
3	214-4814-00		1	Hinge, Front cover pivot
4	650-4039-00		1	Front cover, control panel
5	200-4365-00		1	Left cover
6	200-4495-00		1	Exit cover
7	200-4367-00		1	Top cover with inkload door
8	200-4377-00		1	Rear cover

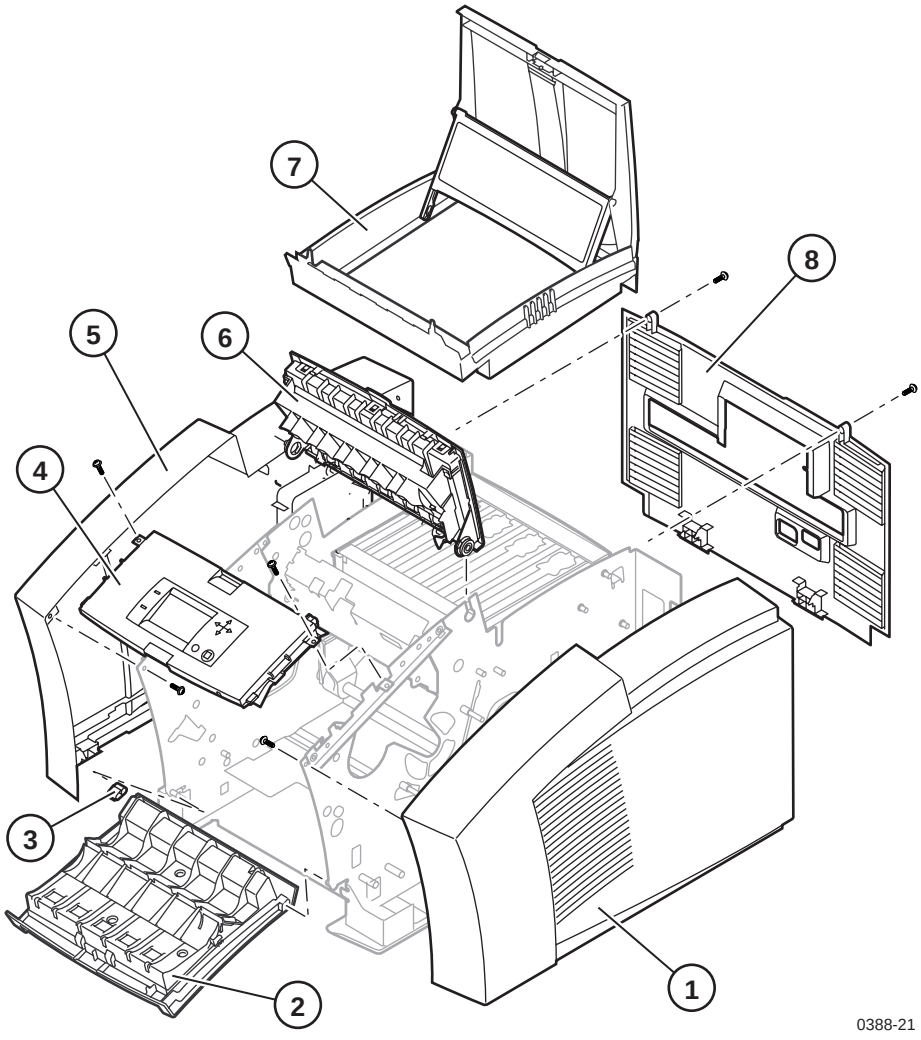


Figure A-1 Cabinet parts

Table A-2. Imaging Parts

Item Number	Part Number	Serial Number Effective/ Discontinued	Qty	Name and Description
1	650-4027-00		1	Y-axis pulley assembly
2	214-4651-01		1	Drum maintenance actuators, left and right
3	351-1051-01		1	Maintenance drawer guide, left
4	436-0389-00		1	Maintenance drawer
5	351-1053-00		1	Maintenance drawer guide, right
6	650-3617-00		1	Spring, transfix actuation. Part of 650-3617-00 Drum/Transfix Assy
7	650-3617-00		1	Drum/transfix assembly
8	441-2137-03		1	Cap/wipe/purge assembly
9	650-4049-00		1	Printhead kit
10	174-3807-00		1	Cable, printhead data
11	650-4050-00		1	Ink loader
12	166-0714-00		1	Vacuum hose, rubber
13	147-0079-00		1	Vacuum/pump assembly
14	166-0713-00		1	Vacuum hose, rigid
15	650-3615-00		1	Head maintenance drive belt. Part of 650-3615-00 Belt Kit
16	650-3619-00		1	Pulley, head maintenance drive. Part of 650-3619-00 Gear Kit
17	650-3615-00		1	Head maintenance timing belt and ratchet clips. Part of 650-3615-00 Belt Kit
18	134-0265-00		1	Plug, Maintenance drawer life counter
19	378-0387-00		1	Purge Filter
Not Shown	200-4379-01		1	Cover heat plate, printhead thermal duct

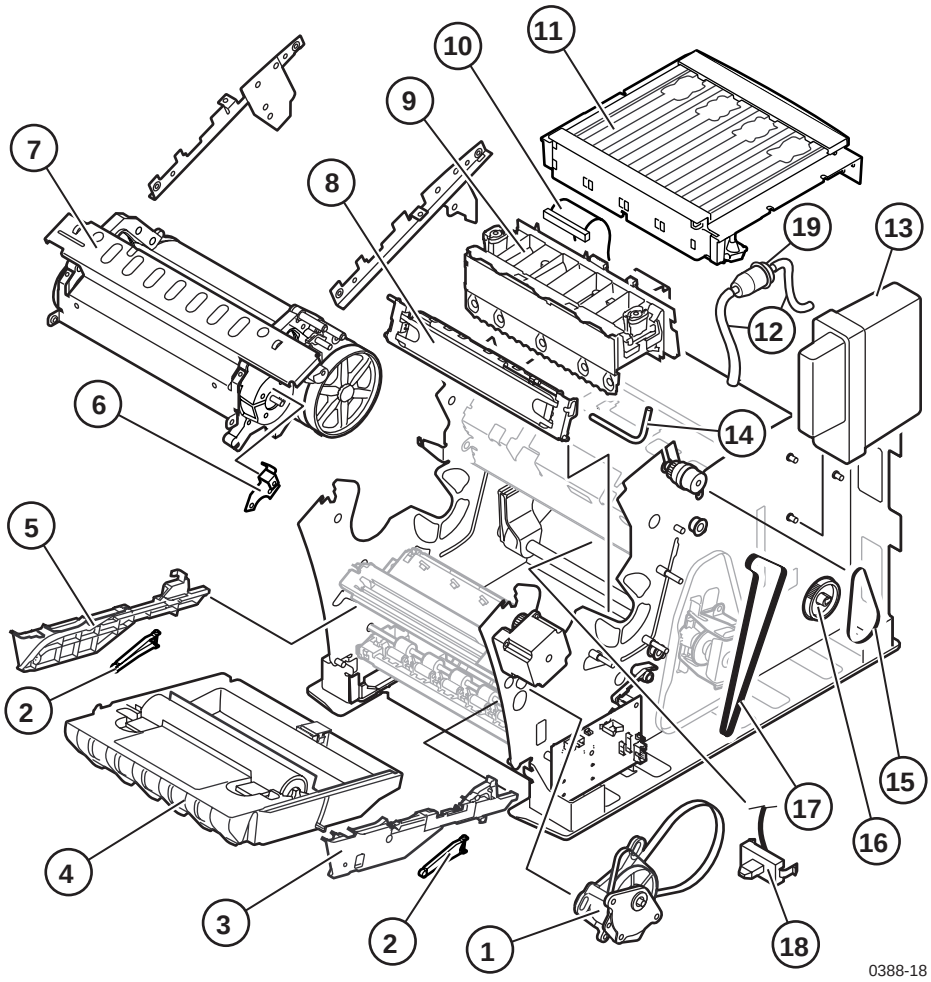


Figure A-2. Imaging Parts

Table A-3. Paper Path Parts

Item Number	Part Number	Serial Number Effective/ Discontinued	Qty	Name and Description
1	351-1045-00		1	Guide, media tray, right
2	351-1032-00		1	Guide, pick assembly
3	351-1046-00		1	Guide, media tray, left
4	401-0778-01		1	Lower feed roller
5	401-0813-01		1	Paper pick roller
6	650-3978-00		1	Drum/preheater assembly
7	351-1047-00 351-1048-00		1 1	Upper feed assy, top half, with circuit bd Upper feed assembly, lower half
8	351-1035-00		1	Duplex paper guide
9	401-0841-00		1	Duplex roller
10	650-4026-00		1	Upper stripper finger assembly
11	386-7018-00		1	Lower stripper finger assembly
12	401-0781-01		1	Exit roller
13	351-1016-00		1	Guide, lower exit, pivoting

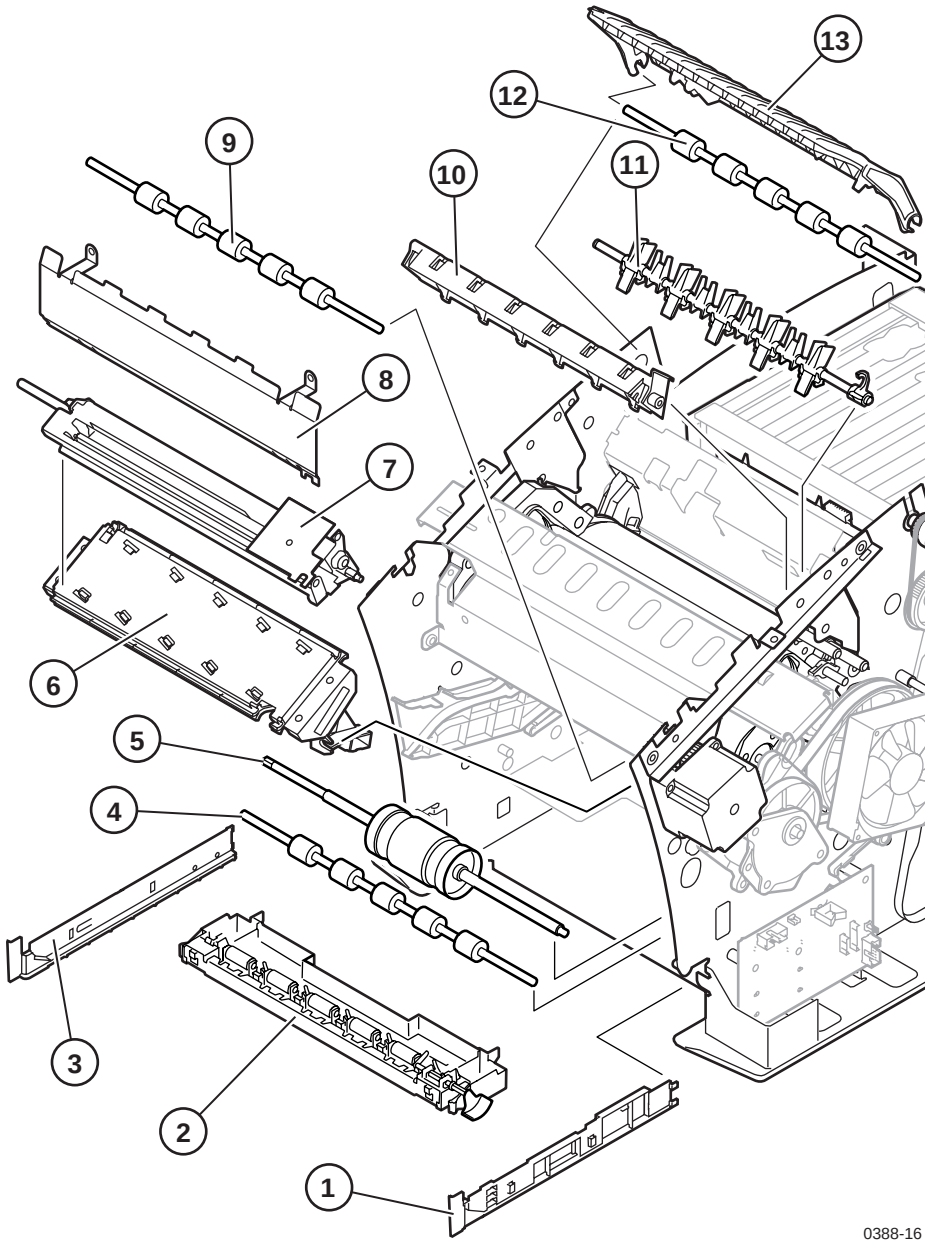


Figure A-3. Paper Path Parts

Table A-4 Motor and fan parts

Item Number	Part Number	Serial Number Effective /Discontinued	Qty	Name and Description
1	147-0086-00		1	X-axis motor with gear
2	650-3621-00		1	X-axis drive assembly (see 650-3621 below)
3	119-5876-00		1	Drum fan
4	147-0180-01		1	Paper path motor
5	147-0082-00		1	Y-axis motor
6	147-0108-01		1	Process motor, with encoder
7	119-5781-00		1	Main fan

	Part Number	Sub-Part Number (Not available individually)	Qty	X-Axis Mechanical Kit
	650-3621	004-3879	1	Shipping box
		334-7987-01	1	Tektronix white label
		401-0828-00	1	Internal thread gear
		401-0829-00	1	Nose cone gear
		401-4598-00	1	Span yoke

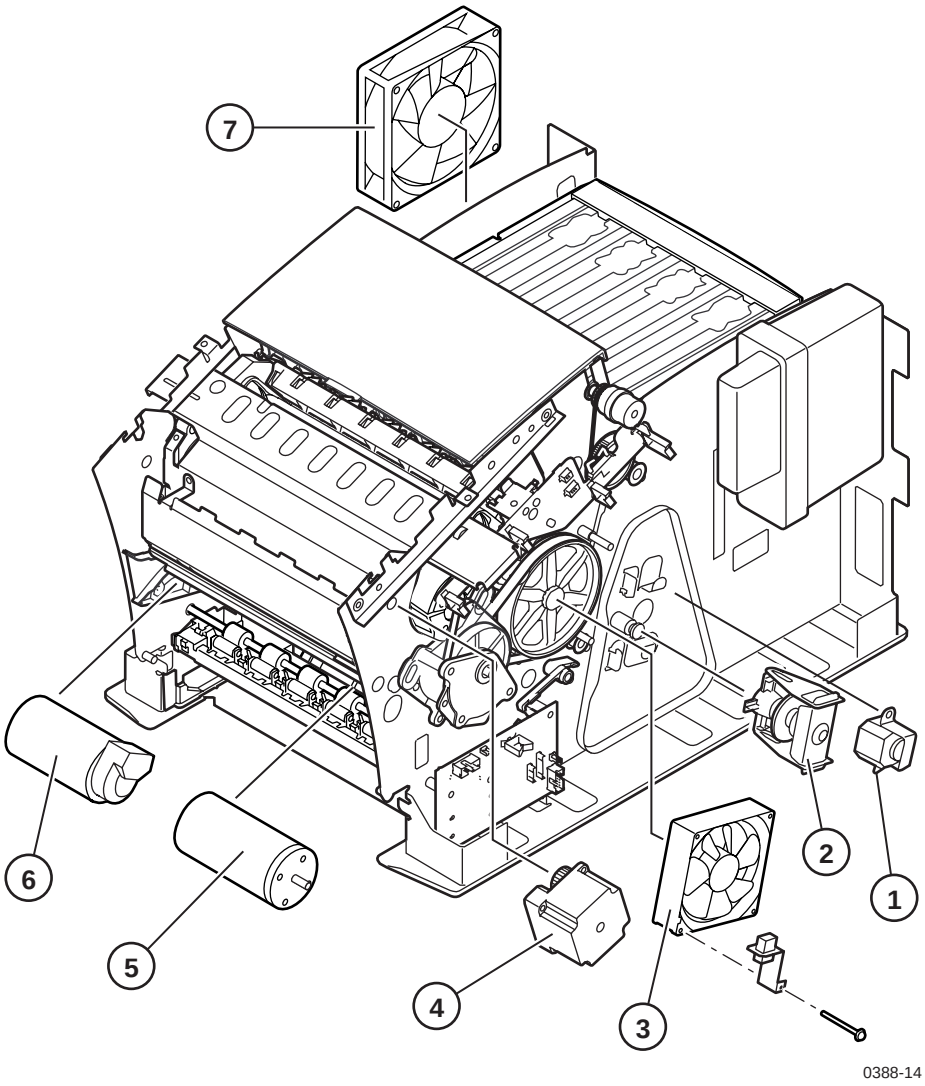


Figure A-4. Motor and Fan Parts

Table A-5. Circuit Board Parts

Item Number	Part Number	Serial Number Effective /Discontinued	Qty	Name and Description
1	671-4194-50		1	I/O board, right
2	671-4195-50		1	I/O board, left
3	386-6997-00		1	Blank cover plate (hard drive)
4	671-3994-01		1	Optional Ethernet interface card
	386-6998-01		1	Blank cover plate (interface card)
5	671-4892-00		1	Flash ROM DIMM, English
	671-4893-00		1	Flash ROM DIMM, Japanese Morisawa
	671-4894-00		1	Flash ROM DIMM, Chinese Traditional
	671-4895-00		1	Flash ROM DIMM, Chinese Simplified
	671-4896-00		1	Flash ROM DIMM, Korean Hangul
	671-4902-00		1	Flash ROM DIMM, Japanese Heisei
6	650-3886-01		1	64-Mbyte RAM DIMM
7	650-4070-80		1	Main board, Power PC w/o memory
8	156-4691-00		1	Dallas Real Time Clock/NVRAM Module
9	650-4024-01		1	Power supply
10	386-7074-00		1	Blank cover plate (SCSI riser board)
11	163-1217-00		1	Boot ROM/Printer ID
12	131-1641-00		1	Jumper, +40 volt isolation
13	650-4029-01		1	Power control board

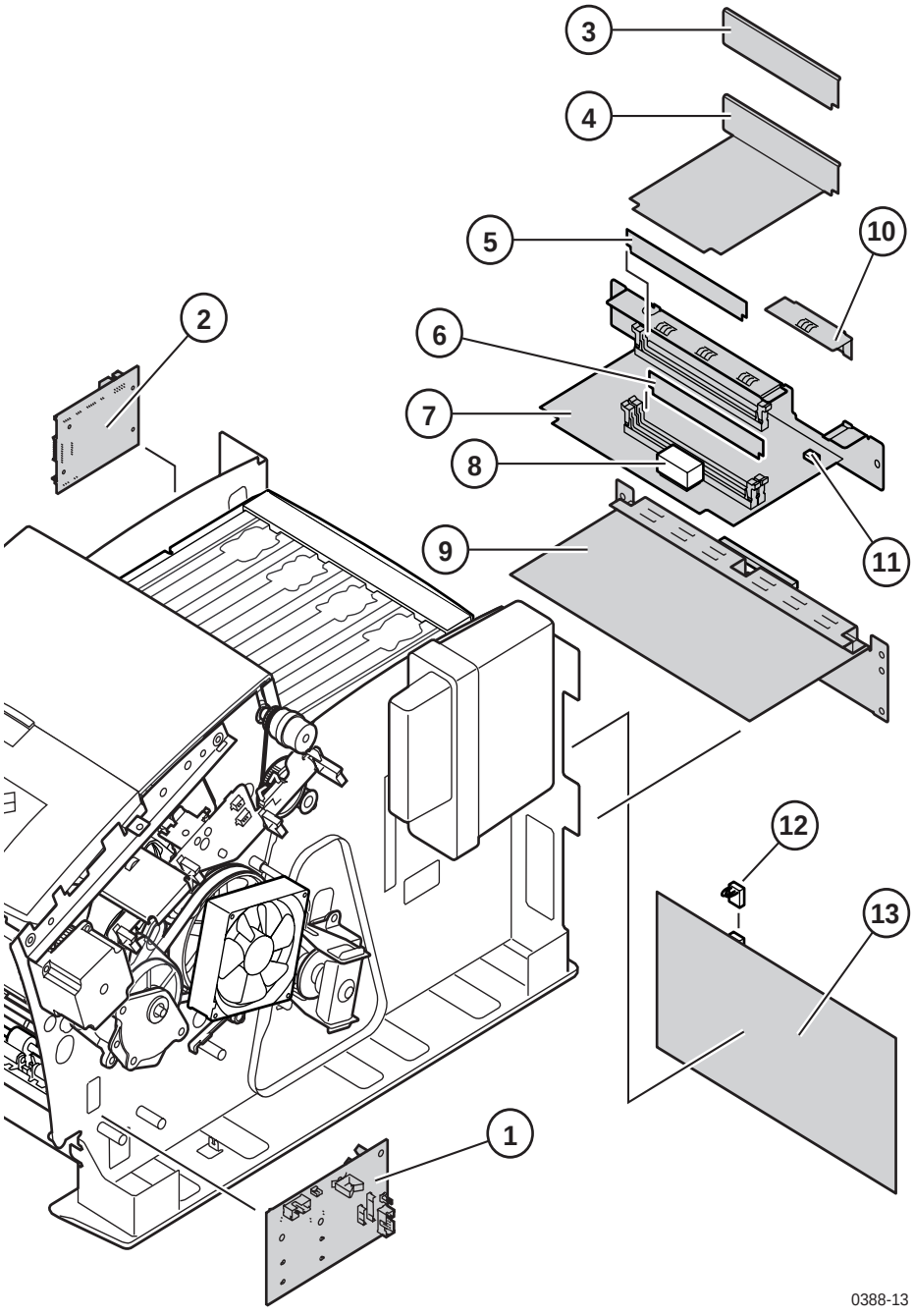


Figure A-5. Circuit Board Parts

Table A-6. Solenoid and Clutch Parts

Item Number	Part Number	Serial Number Effective/ Discontinued	Qty	Name and Description
1	401-0792-00		1	Electric clutch, upper feed roller, exit roller, printhead maintenance
2	401-0808-00		1	Electric clutch, pick roller
3	401-0807-00		1	Electric clutch, drum maintenance
4	401-0792-00		1	Electric clutch, cap/wipe/purge drive
5	148-0301-01		1	Solenoid, transfix assembly

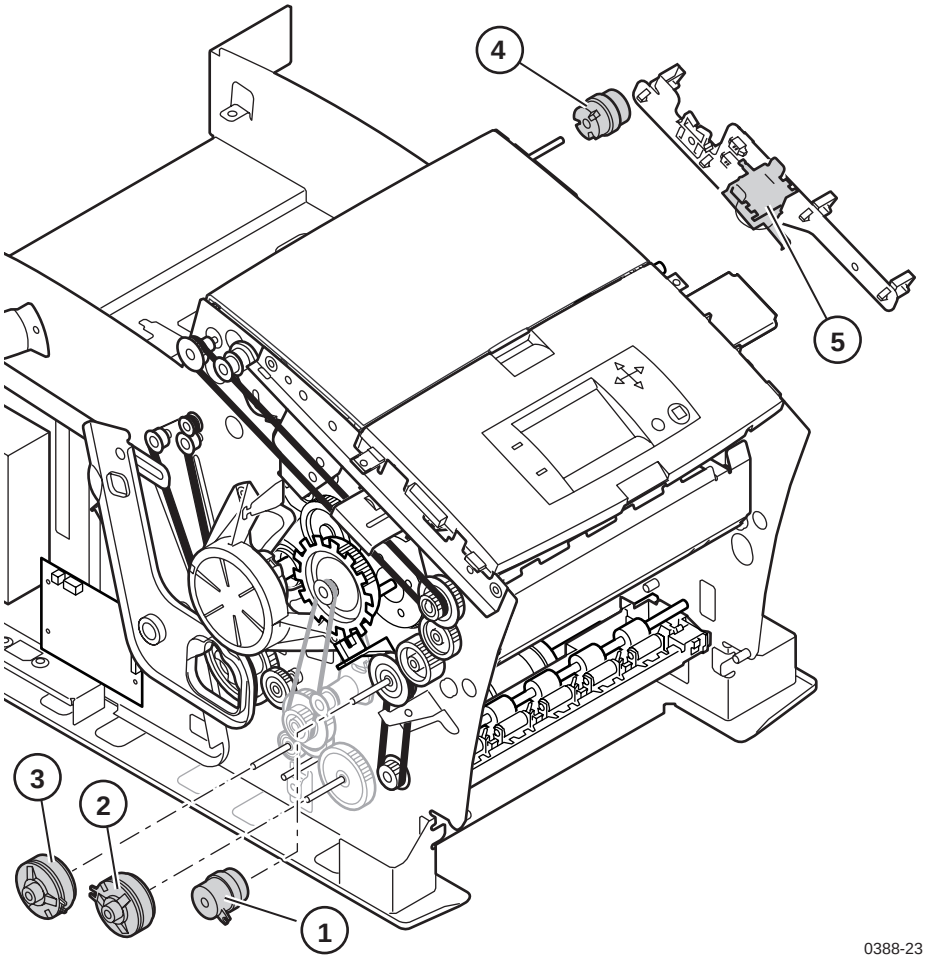


Figure A-6. Solenoid and Clutch Parts

Table A-7. Gear and Belt Parts

Item Number	Part Number	Serial Number Effective/ Discontinued	Qty	Name and Description
1	650-3619-00		1	Pulley, lower paper transport. Part of 650-3619-00 Gear Kit
2	650-3615-00		1	Paper feed roller drive belt. Part of 650-3615-00 Belt Kit
3	650-3615-00		1	Tensioner, process belt. Part of 650-3615-00 Belt Kit
4	650-3619-00		1	Lower process, gear/pulley Part of 650-3619-00 Gear Kit
5	650-3615-00		1	Process drive belt. Part of 650-3615-00 Belt Kit
6	650-3619-00		1	Roller, flat, head maintenance Part of 650-3619-00 Gear Kit
7	650-3619-00		1	Head tilt cam gear. Part of 650-3619-00 Gear Kit
8	351-1015-00		1	Guide, head tilt
9	650-3615-00		1	Head maintenance timing belt and ratchet clip. Part of 650-3615-00 Belt Kit
10	650-3619-00		1	Pulley, drive, head maintenance Part of 650-3619-00 Gear Kit
11	650-3615-00		1	Exit roller drive belt. Part of 650-3615-00 Belt Kit
12	650-3619-00		1	Pulley, exit drive. Part of 650-3619-00 Gear Kit
13	650-3615-00		1	Tensioner, exit drive belt. Part of 650-3615-00 Belt Kit
14	650-3619-00		1	Transfix gear, eccentric Part of 650-3619-00 Gear Kit
15	650-3619-00		1	Gear, compound eccentric, flagged Part of 650-3619-00 Gear Kit
16	650-3619-00		1	Duplex roller, gear pulley. Part of 650-3619-00 Gear Kit
17	650-3619-00		1	Paper path, idler 1 Part of 650-3619-00 Gear kit
18	650-3619-00		1	Paper path, idler 2 Part of 650-3619-00 Gear Kit
19	650-3619-00		1	Gear/pulley, upper feed roller, preheat entry Part of 650-3619-00 Gear Kit
20	650-3627-00		1	Head Tilt Assembly

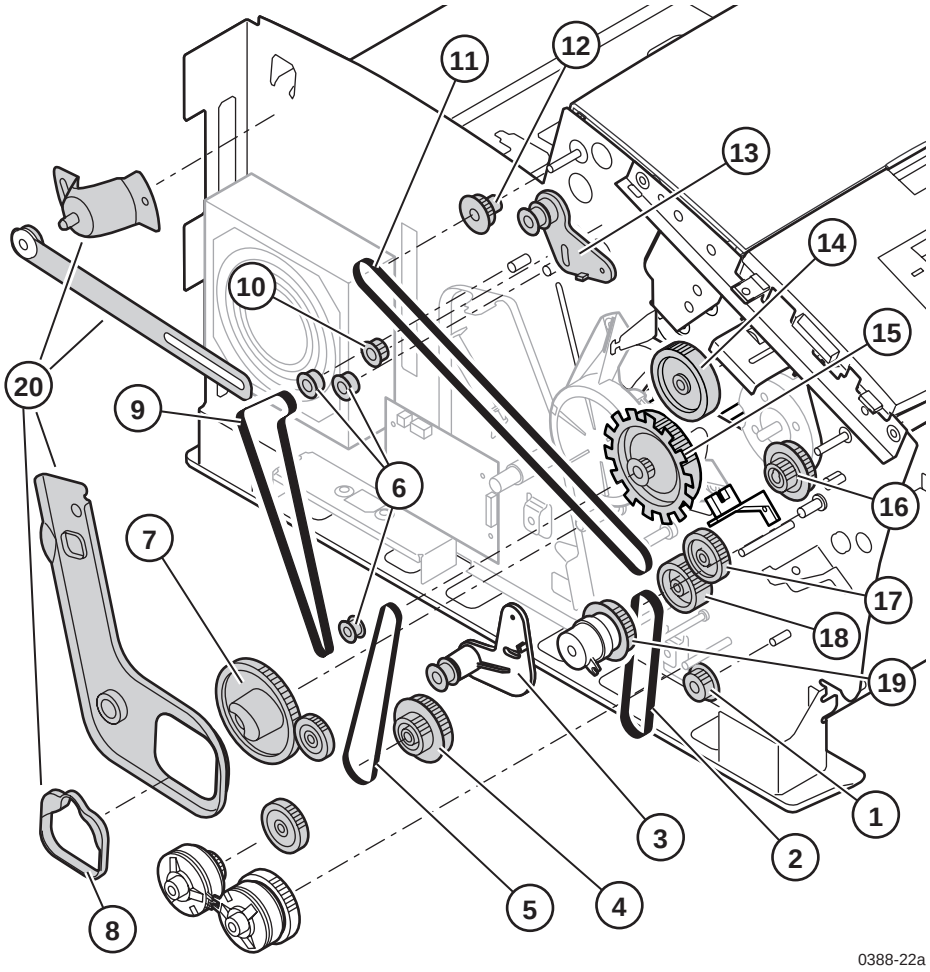


Figure A-7. Gear and Belt Parts

Table A-8. Sensor and Flag Parts

Item Number	Part Number	Serial Number Effective /Discontinued	Qty	Name and Description
1	650-3618-00		1	Cap/wipe/purge home flag. Part of 650-3618-00 Flag Kit
2	650-3618-00		1	Drum maintenance cam home flag. Part of 650-3618-00 Flag Kit
3	386-6902-00			Media tray sense flag assembly
4	650-3618-00		1	Paper out sensor flag. Part of 650-3618-00 Flag Kit
5	650-3618-00		1	Paper pick flag. Part of 650-3618-00 Flag Kit
6	650-3618-00		1	Handfeed sensor flag, inside front access cover. Part of 650-3618-00 Flag Kit
7	351-1047-00		1	Preheat entry/right edge sensor, A-size sensor, handfeed sensor. Part of 351-1047-00 upper feeder roller assembly.
8	119-5803-00		1	Preheater exit sensor assembly
9	119-4968-00		1	Process gear sensor
10	650-3622-00		1	Y-axis encoder kit (see 650-3622 below).
11	650-3618-00		1	Transfix exit sensor flag. Part of 650-3618-00 Flag Kit and 351-1016-00 Pivoting Low Exit Guide.
12	119-5800-00		1	Front cover open sensor. Part of 650-4039-00 Front Cover, Control Panel.
13	650-4039-00		1	Duplex paper sensor flag Part of 650-4039-00 Front Cover, Control Panel.
14	650-4039-00		1	Duplex paper sensor. Part of 650-4039-00 Front Cover, Control Panel.
15	119-5800-00		1	Exit cover open sensor. Part of 650-4039-00 Front Cover, Control Panel.
16	119-5795-01		1	Drum temperature sensor assembly
17	119-5802-00		1	Transfix exit sensor. Part of 119-5802-00 Paper Path Sensor assembly
18	119-5802-00		1	Paper exit/tray full sensor. Part of 119-5802-00 Paper Path Sensor assembly
19	200-4495-00		1	Paper exit/tray full flag. Part of 200-4495-00 Exit Cover assembly.

	Part Number	Sub-Part Number (Not available individually)	Qty	Y-Axis Encoder Kit
	650-3622-00	004-4634-00	1	Tuck mailer
		105-1078-00	1	Encoder connector retainer
		119-5804-00	1	Y-axis home sensor
		200-4254-00	1	Y-axis position cover
		213-1091-00	2	2-28 x .625 screw
		213-1124-00	2	4-20 x .375 T-10 screw
		214-4645-00	1	Rotational encoder assembly
		214-4587-00	1	Y-axis encoder disk
		401-0720-00	1	Y-axis encoder hub
		401-0736-00	1	Y-axis retainer hub
		311-2506-00	1	Y-axis encoder
		334-7987-01	1	Tektronix white label
		407-4315091	1	Encoder bracket

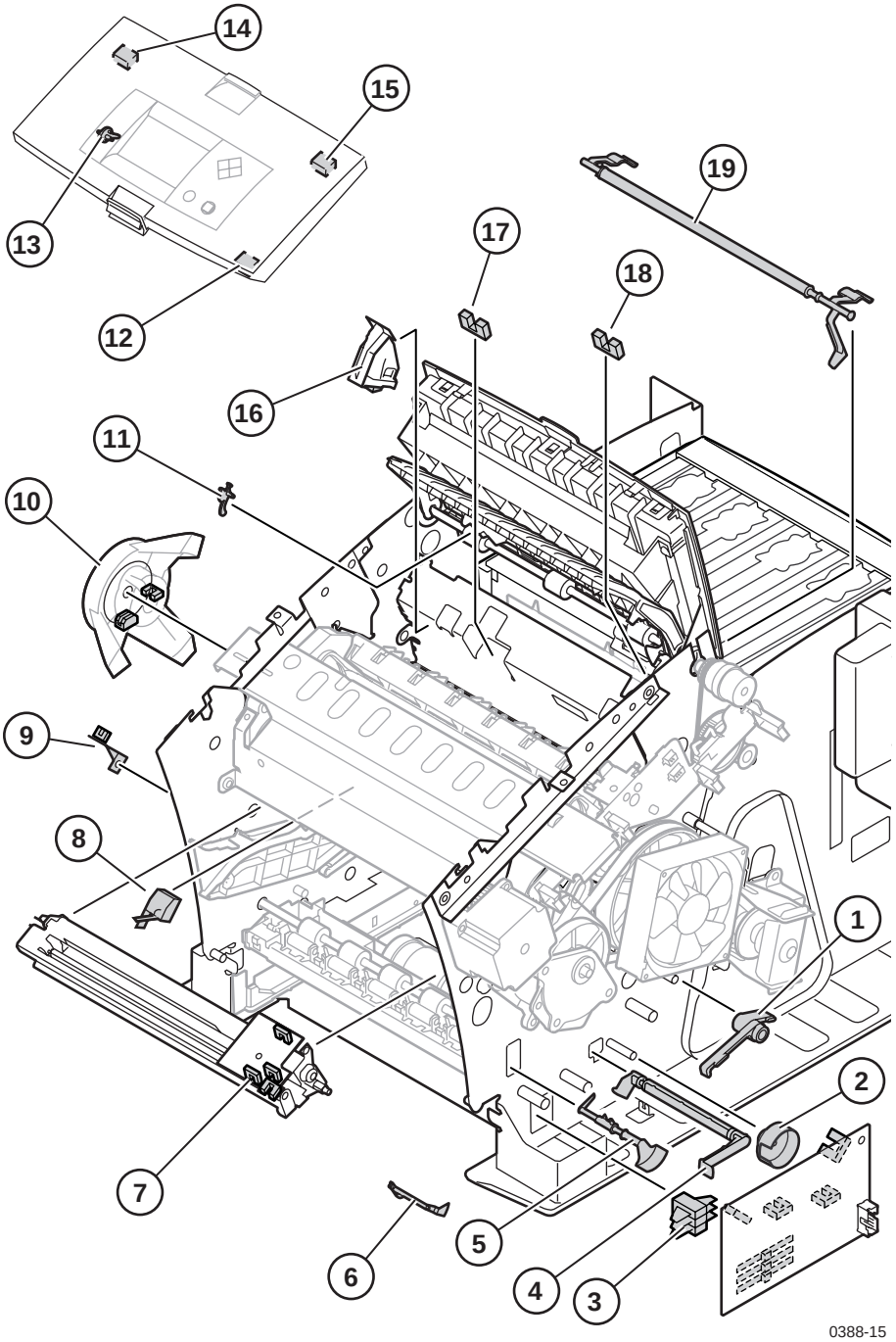


Figure A-8. Sensor and Flag Parts

Service Tools

Table A-9 Service tools

Part Number	Serial Number Effective /Discontinued	Qty	Name and Description
003-1489-00		1	Y-axis encoder disk spacer tool
003-1500-00		1	Y-axis belt tensioner
006-7997-00		1	Grease, Rheolube 768
012-1535-00		1	Cable, Diagnostics,PC, DB-9F to DB25M
012-1543-00		1	Cable, adapter, diagnostics
003-1707-00		1	+40 volt service plug and jumper
003-1749-00		1	Head-to-drum calibration tool kit
003-1733-00		1	Head-to-drum spacer replacements
003-3209-00		1	Service diagnostics diskette, SW v 8.24
003-1503-00		1	Printhead removal tool
003-1504-00		1	Printhead resevoir plug set
003-0814-00		1	T10 Torx Bit
003-0966-00		1	T15 Torx Bit
003-0866-00		1	T20 Torx Bit
003-1462-01		1	T-25 Tork Bit
003-1377-00		1	Vacuum Gauge
131-6819-00		1	Vacuum “T” Fitting

Parts Kits

Table A-10. Parts Kits

Part Number	Serial Number Effective /Discontinued	Qty	Name and Description
650-3615-00		1	Solid Inkjet 100 Belt Kit
650-3616-00		1	Solid Inkjet 100 Cable Kit
650-3618-00		1	Solid Inkjet 100 Flag Kit
650-3619-00		1	Solid Inkjet 100 Gear/Pulleyt Kit
650-3620-00		1	Solid Inkjet 100 Hardware Kit

Part Number	Sub-Part Number (Not available individually)	Qty	Belt Kit
650-3615-00	004-4386-00	1	Shipping Box
	214-4811-00	1	Exit Drive Belt
	214-4812-00	1	Simplex Transport Belt
	214-4815-00	1	Lower Process Belt
	214-4826-00	1	Drive Belt
	344-0540-00	1	Base Belt Clip
	344-0541-00	1	Ratchet Belt Clip
	401-0727-00	2	Idler Pulley
	407-4501-00	1	Exit Belt Tensioner
	407-4547-01	1	Process Belt Tensioner

Part Number	Sub-Part Number (Not available individually)	Qty	Cable Kit
650-3616-00	004-4386-00	1	Shipping Box
	174-3803-01	1	Heater Cable
	174-3804-00	1	I/O Left Cable
	174-3805-00	1	I/O Right Cable
	174-3808-01	1	Left Umbilical Cable
	174-3809-00	1	Right Umbilical Cable
	174-3810-00	1	Vacuum Module Cable
	174-3811-00	1	Y-Axis Pos. Encoder Cable

Part Number	Sub-Part Number (Not available individually)	Qty	Flag Kit
650-3618-00	004-4386-00	1	Shipping Box
	105-1066-02	1	Latch Flag (C/W/P Home Flag)
	386-6681-00	1	Paper Out Flag
	386-7020-00	1	Paper Pick Flag
	386-7028-00	1	Sensor Strip Flag
	386-7037-00	1	Handfeed Entrance Flag
	386-7081-00	1	DM Home Flag

Table A-10. Parts Kits (continued)

Part Number	Sub-Part Number (Not available individually)	Qty	Flag Kit
650-3619-00	004-3879-00	1	Shipping Box
	334-7987-01	1	White Tektronix Label
	401-0715-00	1	Eccentric Shaft Compound Gear
	401-0727-00	2	Idler Pulley
	401-0728-00	1	Drive Shaft Pulley
	401-0795-00	1	Preheat Entry Gear/Pulley
	401-0796-00	1	Idler #1 Paper Path Gear
	401-0797-00	1	Idler #2 Paper Path Gear
	401-0798-01	1	Duplex Roller Gear
	401-0799-00	1	Duplex Roller Gear/Pulley
	401-0800-00	1	Exit Drive Pulley
	401-0801-00	1	Lower Transport Pulley
	401-0803-00	1	Preheat Entry Roller Gear
	401-0805-00	1	HM Drive Pulley
	401-0806-00	1	DM Cam
	401-0810-00	1	Cap Drive Pulley
	401-0812-00	1	Flat Roller
	401-0818-00	1	Lower Process Gear/Pulley
	401-0819-00	1	Head Tilt Cam
	401-0839-00	1	Eccentric Shaft Gear

Part Number	Sub-Part Number (Not available individually)	Qty	Hardware Kit
650-3620-00	004-4386-00	1	Shipping Box
	210-1509-00	5	Washer, 0.5 x 0.204
	211-0409-01	5	Screw with washer, 4-40 x .312
	212-0195-00	5	M4-7 x 12mm screw
	212-0199-01	5	Shoulder bolt, 8-32 x .687
	212-0206-00	5	8-32 x 1.00 T-20 Taptite
	212-0207-00	5	8-18 x .75 T-20 Torx
	212-0209-00	5	8-32 x .375 Torx
	212-0219-00	5	8-32 x .75 screw
	212-0221-00	3	10-32 x 5/8 x .060 captive washer
	213-0906-01	5	8-32 x .375 screw
	213-1075-00	5	10-32 x .5, T-25 screw
	213-1096-00	5	8-32 x .5 torx screw
	213-1109-00	5	6-32 x .375 T-15 torx screw
	213-1111-00	5	6-32 x 1.25 T-15 screw
	213-1115-00	5	8-16 x .5 torx screw
	213-1118-00	5	4-40 x 5/16 slotted combo torx
	213-1119-00	5	6-32 x 5/16 slotted combo torx
	354-0737-00	5	.125 e-ring
	354-0738-00	5	5mm e-ring
	354-0756-00	5	M6, 5mm bent e-ring
	358-0791-00	5	bushing
	358-0823-00	5	exit roller bushing
	358-0824-00	5	preheat entry roller bushing

Supplies and Accessories

Table A-11. Supplies and Accessories

Part Number	Serial Number Effective /Discontinued	Qty	Name and Description
FSD10695		1	Solid Inkjet 100 Cleaning Kit
FSD10393		1	Solid Inkjet Swabs/Pads (10)
348-1572-00		1	Separator pad, paper
FS016-1752-00		1	Maintenance cartridge kit; roller and counter
436-0370-00		1	Waste ink tray
013-0299-00		1	Parallel cable adapter, 1284C to 1284B
650-1200-01		1	Drivers and Utilities, CD, English
650-1155-01		1	Drivers and Utilities, CD, European Languages
650-1170-01		1	Drivers and Utilities, CD, Japanese
650-1190-01		1	Drivers and Utilities, CD, Simplified Chinese
650-1180-01		1	Drivers and Utilities, CD, Traditional Chinese
650-1160-01		1	Drivers and Utilities, Diskettes, Korean
161-0305-00		1	Power cord, Standard U.S., 115V
065-0586-00		1	Shipping carton kit